TOWARDS AN APPROPRIATE MALARIA CONTROL STRATEGY

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TOWARDS AN APPROPRIATE MALARIA CONTROL STRATEGY

Issues of Concerns and Alternatives for action

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FOREWORD

Malaria has been present in India from time immemorial. In 1897, Sir Ronald Ross of Indian Medical Service made the epic making discovering of life cycle of malaria parasite in the mosquito. This led to the understanding of the involvement of biological factors namely malaria parasite, mosquito, human host and their dependence on environment for perpetuation of the disease. Widespread prevalence of malaria in India, among other factors, was responsible for the slow economic and industrial progress during the last two centuries. The National Malaria Control Programme in India was launched in 1953 and National Malaria Eradication Programme (NMEP) in 1958. The programme achieved remarkable success when in 1964 about 100,000 cases were reported with no deaths. The resurgence of Malaria after 1964 reached its peak in 1976, when about 6.7 million cases were recorded. Inspite of best efforts by NMEP, the situation has plateaued to around 2 to 3 million cases with gradual increase of cereberal malaria due to P. falciparum.

The resurgence of Malaria, as a major Public Health problem, has become a matter of serious concern for health policy makers and planners especially in the last decade. Since the serious epidemics in Rajasthan (1994) and North East (1995), Haryana (1996), the Voluntary Health sector has become seriously concerned about the problem of Malaria. In April 1996, Voluntary Health Association of India (VHAI) convened an Expert Group on Malaria and an alternative reflective process was initiated to seek wider opinion on the malaria situation and suggestions on how to tackle this problem. The Expert Group has prepared this document "TOWARDS AN APPROPRIATE MALARIA CONTROL STRATEGY - Issues of Concern and alternatives for action". The document highlights the problem of underestimation of malaria; the need to strengthen the behavioural sciences dimension in planning and research; the challenges of rationalising malaria diagnosis and treatment, including the potential misuse of mefloquin; the alternatives in vector control strategies; and the need to rediscover the community dynamics and dimensions in malaria control including community capacity building, health education, role of voluntary sector, general practitioners and panchayat leadership and the urgency of decentralised planning and the assessment of the role of the ISMs. Policy issues such as health human power development, research, monitoring and forecasting, corruption and political interference, Centre-State responsibility and International public health co-operation are also included.

It is hoped that this document would help in creating more active and appropriate response to the problem of Malaria in India.

Alok Mukhopadhyay
Executive Director, VHAI.

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Expert Group on Malaria

ABBREVIATIONS USED IN THIS DOCUMENT

ACD	⇨	Active Case Detection
API	⇨	Annual Parasite Index
BHC	⇨	Benzene Hexa Chloride
BIMARU	⇨	Bihar - Madhya Pradesh - Rajasthan - Uttar Pradesh
CDRI	⇨	Central Drug Research Institute
CHV	⇨	Community Health Volunteer
CME	⇨	Continuing Medical Education
CGHS	⇨	Contributory Government Health Services
CIMS	⇨	Current Index of Medical Specialities
CDC	⇨	Centre for Disease Control (USA)
CMAI	⇨	Christian Medical Association of India
CHAI	⇨	Catholic Health Association of India
DDT	⇨	Dichloro-Diphenyl-Trichloroethane
DMO	⇨	District Medical Officer
DPCO	⇨	Drug Price Control Order
EDPT	⇨	Early Diagnosis Prompt Treatment
EIA	⇨	Environmental Impact Assessment
ESI	⇨	Employees State Insurance Scheme
FP	⇨	Family Planning
GOI	⇨	Government of India
G6PD	⇨	Glucose 6 Phosphate Dehydrogenase
ICMR	⇨	Indian Council of Medical Research
IMA	⇨	Indian Medical Association
IBNs	⇨	Impregnated Bed Nets
IEC	⇨	Information Education Communication
ISM	⇨	Indian Systems of Medicine
IMS	⇨	Indian Medical Service
ICSSR	⇨	Indian Council of Social Science Research
LHT	⇨	Local Health Tradition
MIS	⇨	Management Information Systems
MRC	⇨	Malaria Research Centre
MCH	⇨	Maternal and Child Health
MEG	⇨	Malaria Expert Group (of VHAI)
mfc	⇨	medico friend circle
MECU	⇨	Mobile Epidemic Control Units
MAP	⇨	Malaria Action Plan
MPW	⇨	Multi Purpose Workers
NICD	⇨	National Institute of Communicable Diseases
NMEP	⇨	National Malaria Eradication Programme
NGO	⇨	Non Governmental Organisation
NIHFW	⇨	National Institute of Health and Family Welfare
PCD	⇨	Passive Case Detection
PHC	⇨	Primary Health Centre
PIL	⇨	Public Interest Litigation
RMP	⇨	Registered Medical Practitioner
VHAI	⇨	Voluntary Health Association of India
VCRC	⇨	Vector Control Research Centre, Pondicherry
VOLAGS	⇨	Voluntary Agencies

BACKGROUND TO THE DOCUMENT

- The Resurgence of Malaria as a major Public Health problem, has become a matter of serious concern for health policy makers and planners especially in the last decade.

  Serious Malaria outbreaks and epidemics have been reported in the States of Rajasthan (452 deaths), Nagaland (253 deaths), Andhra Pradesh (173 deaths),Manipur (48 deaths) and West Bengal (3 deaths) in 1994. In 1995, Assam, West Bengal and Maharashtra States experienced malaria outbreaks in number of districts with high morbidity and reports of deaths. (86/87)

- For decades Malaria control/eradication has been a National disease control programme. The National Malaria Eradication Programme planners and the Malaria Research Centre of the Indian Council of Medical Research and all its field stations, as well as other research centres such as Vector Control Research Centre, Pondicherry, have been seriously involved in assessing the situation, monitoring the epidemiological trends and changes and evolving programme responses and initiatives to tackle the situation.

- Following the Report of the National Task Force on Revised Strategy for Control of Malaria (February 1993). numerous key documents and programme initiatives have emerged including the VIII Five Year Plan Policy cum operational document of NMEP; Operational Manual for Malaria Action Programme, NMEP (July and November 1995); the Malaria Control project document submitted by NMEP for World Bank funding entitled 'Strengthening Malaria Control in India (1995)'; the Training modules for Medical Officers of Primary Health Centres, NMEP (1995); the National Malaria Control Strategy booklet of Malaria Research Centre, ICMR (1994), the Drug Policy on Malaria (1995), and more recently the set of 10 booklets/pamphlets of MRC released for the ICMR Jubilee covering all aspects of Malaria Control. These documents reflect the new strategies and approaches and thrusts that the malaria policy makers and planners, feel would help to tackle the problem.

- Since the serious epidemics in Rajasthan (1994) and North East (1995) the Voluntary Health sector has become seriously concerned about the problem of malaria and some concerted, collective initiatives have begun to emerge. Some workshops of concerned representatives of the sector have been organised by Voluntary Health Association of India in Rajasthan and Assam to help the sector to understand the problem and to get more involved in tackling the problem at the field level.

- While the Voluntary Sector (also referred to as the Not for Profit NGO Sector) has been primarily involved all these years with community development and community health programmes and initiatives focussing primarily on MCH and Family Welfare, the interest and involvement in communicable disease control has been increasing over the years. Small grassroot level programme initiatives have taken place tackling Malaria, Tuberculosis, Kalazar and other local disease problems. These efforts have not been adequately documented or monitored to evolve useful lessons for others in the sector, who want to get involved as well. Some case studies and situation analysis are included in this report, focussing on their experiences.

- The voluntary sector, in the last two decades, has also been getting more involved with critical analysis of existing health policies and programmes and suggesting alternatives for action based on micro-level grassroots experiences. The voluntary sector is therefore not only an alternative service provider but in recent years has also become an alternative trainer, researcher, awareness builder, health educator and pressure group for alternate or more effective public policy.

  The Independent Health Commission facilitated by the Voluntary Health Association of India (1994) began a process of bringing together much of this alternate perspectives to evolve a document that is to be submitted to the 9th plan policy planners soon. While the return of the 'communicable diseases' epidemics and the breakdown of public health was an area of major concern for the commission, its deliberations were focussed on an overall policy formulation.

- Keeping in mind the increasing significance of the 'Malaria resurgence', VHAI initiated a dialogue on 'Rational Malaria care' in 1995 by bringing together an adhoc technical working group to look at various aspects of malaria treatment and review the recently evolved guidelines of NMEP for Malaria Action Plan.

- In Orissa, the Voluntary Health sector projects have recently come together to share experiences, network and work together on the malaria situation supported by organisations such as RUHSA - Tamil Nadu, Action Aid - Bangalore and others.

- In April 1996, taking this process further an Expert Group on Malaria (MEG) was convened and an interactive reflective process was initiated to seek wider opinion on the malaria situation and suggestions on how to tackle the problem. The process of collation and consultation initiated by the six member expert group was aimed at bringing together all the complementary initiatives and processes that have been going on in the voluntary sector over the last few years thereby strengthening the collectivity in the emerging efforts.

- The reflections of the group were supplemented by an interactive process that received perspectives, reflections, personal communications and other forms of 'ideas contributions' from a large network of individuals, projects, initiatives primarily in the 'voluntary sector' who were part of a Reference group. They were contacted through the existing national and regional networks of voluntary agencies in Health and also through the announcements in the health journals of the voluntary sector.

- This document is the first output of this extended interactive process, wherein the Malaria Expert Group have brought together the key issues of concern in the Malaria situation and the evolving malaria control policy, identified through a review of existing policy documents and guidelines supplemented by their own field experiences and that of fellow travellers and field workers, activists , trainers, researchers and awareness builders in Community Health all over the country.

- The document recognises the phenomenal contribution and consistent technical leadership that the National Malaria Eradication Programme planners has provided all these years. It also appreciates the significant contribution of Malaria Research Centre of ICMR and all its field stations as well as the contribution of institutions like the Vector Control Research Centre, Pondicherry, in studying the technical intricacies of the problems of malaria in the country and evolving and testing out methods of control and strategies to tackle the problem. In fact the document has drawn upon this wealth of experience and perspective greatly.

- What the 'Expert Group process' has however tried to do is to review all that has been going on in the past in Malaria Control; all that is currently going on at the field and policy levels; and all that is being considered or planned as future policy thrusts and associated guidelines. It has tried to move beyond just a critique to a more realistic, action oriented exercise that will suggest complementary/supplementary/alternative perspectives and identify possible new directions for action. Key issues of concern some of which have not been adequately considered in the recent planning process have been highlighted and some alternatives for action suggested. While building on the wealth of experience of NMEP in the country , the group has tried to bring together ideas from the vast and growing network of community health action initiators in the voluntary sector

- Different aspects and areas of the Malaria problem and the Malaria Control Programme have been considered and some significant issues of concern and suggestions for action have been outlined. It was not possible to cover all aspects in the time available. But all those areas, in which the voluntary sector had experience and something to offer has however been included.

- We hope the document will generate an interest and active dialogue on malaria and malaria control initiatives not only in the voluntary sector but also stimulate everyone interested and involved in Malaria contgol to look at important areas of concerns and potential areas of initiative. If we are able to generate an increasing dialogue and commitment to action, we would feel satisfied with our efforts.

- While acknowledging the contributions of all those who have participated in the exercise, we take the responsibility for the document, for the views therein and for any errors or inaccuracies that may have crept in.

The Voluntary Health Association of India - Malaria Expert Group (MEG)

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5TH FEBRUARY 1997.

EXECUTIVE SUMMARY

TOWARDS AN APPROPRIATE MALARIA CONTROL STRATEGY

Issues of concern and alternatives for action

EXECUTIVE SUMMARY

TOWARDS AN APPROPRIATE MALARIA CONTROL STRATEGY

Issues of Concern and alternatives for action

1. BACKGROUND

In 1952, there were 75 million malaria cases with 0.8 million deaths per year in India. The National Malaria Control Programme (NMCP) was launched in 1953 and National Malaria Eradication Programme (NMEP) in 1958. The programme achieved remarkable success when in 1964 about 100,000 cases were reported with no death. The resurgence of Malaria after 1964 reached its peak in 1976, when about 6.7 million cases were recorded. Inspite of best efforts by NMEP, the situation has plateaued to around 2 to 3 million cases with gradual increase of cereberal malaria due to P.falciparum. The resurgence of Malaria as a major Public Health problem has become a matter of serious concern for health policy makers and planners especially in the last decade, due to occurrence of epidemics e.g. in the States of Rajasthan (452 deaths), Nagaland (253 deaths), Andhra Pradesh (173 deaths), Manipur (48 deaths) and West Bengal (3 deaths) in 1994 and in 1995, Assam, West Bengal and Maharashtra States experienced malaria epidemics with high morbidity and reports of deaths.

Voluntary Health Association of India (VHAI) was actively involved in field investigation of malaria epidemic and malaria control measures in Rajasthan State in 1994 and Assam State in 1995. VHAI also organised a National Consultation on 'Rational Care of Malaria' in June 1995 at Guwahati, Assam, in which officials from the NMEP Directorate, State Health Department and NGOs participated.

In April 1996, VHAI convened an Expert Group meeting on Malaria (MEG), six member expert group, to seek wider opinion on the malaria situation and suggestions on how to tackle the problem. The process of collation and consultation initiated by the six member expert group was aimed at bringing together all the complementary initiatives and processes that have been going on in the voluntary sector over the last few years thereby strengthening the collectivity in the emerging efforts.

This 'Expert Group process' has tried to move beyond just a critique to a more realistic, action oriented exercise that suggest complementary/supplementary/alternative perspectives and identify possible new directions for action. Key issues of concern some of which have not been adequately considered in the recent planning process have been highlighted and some alternatives for action suggested.

2. SOCIO-EPIDEMIOLOGY OF MALARIA

2.1 Malaria Situation - the Problem of underestimation

- NMEP estimates on malaria morbidity have been cross checked, to the extent possible on the basis of consumption of anti-malarials especially chloroquin phosphate and it has been suggested by them that a more realistic and safer assumption would be that 20 to 30 million episodes occur every year as against 2 to 3 million cases reported by NMEP.

- The deaths due to Malaria reported annually by NMEP are between 200-500 from 1984

to 1993 with an increase to 1000 + in 1994 and 1995. If crude death rate in the country is 10.8/1000 and of the 7.4% fever deaths, 0.8% are malaria fevers (GOI information) then on this estimation deaths would be expected to be 73795. Vital statistics of India collected separately also reported malaria deaths as 137,846 in 1985 and 75,285 in 1987 (NMEP figures were 213 and 188 respectively).

- *In the absence of Malaria being a notifiable diseases, any surveillance system which disregards the non-governmental sector including the private sector is bound to produce a gross underestimation of reality.*

- In most of the States, the availability of laboratory technicians at PHC level are diminishing with vacancies of 50-75% not being uncommon. In such a situation under-reporting of cases will become the norm.

- *All these factors taken together contribute to a consistent under-reporting which weaken and undermine the planning process. A very important long term step is therefore to strengthen the epidemiological surveillance system so that the programme is able to plan on the actual magnitude rather than on an under-estimate.*

2.2 Epidemiological Aspects of Malaria Control

- *Malaria being exclusively focal phenomena governed by presence of parasite, vector, susceptable hosts and suitable environmental conditions in the community, it is important that national and/or state level programme norms or guidelines need to be flexible and should allow diversity of response to the diverse focal situation.*

- There is urgent need to effectively monitor the spread of P.falciparum (which causes cereberal malaria) all over the country. Resistance to chloroquine in P.falciparum was first reported in the North-East/Assam (1973) but now it has slowly spread to many other parts as well. NMEP has been gradually mapping the resistance problem but this data is not yet adequately shared or communicated to the health care practitioners to help them modify their treatment schedules and treat resistant forms actively with alternative regimens. This sharing and distribution of information is crucial for malaria control.

- While vector dynamics are important component of malaria control, the inadequate or near absence of field oriented entomologists mean that a major adjunct to policy analysis and solution is being neglected. **The acute shortage of entomologists and the improper deployment or support to those who are in the public health system and NMEP is reaching a crisis situation which needs urgent policy redressel.**

- One of the major problems in the Urban Malaria Scheme (UMS) is that the responsibility of implementing them lies with the local bodies like municipalities and corporations. In most urban areas, local bodies plead lack of resources for doing a poor job in malaria control. A large number of UMS posts remain vacant; blood smears remain unexamined for months to end; fogging and space spray operations are done only when there are outbreaks; larviciding operations are conducted without any evaluation or monitoring.

- The mosquitogenic potential of large development projects such as dams, irrigation/ canal systems, bridges, laying of roads and railway lines etc. or establishment of large industries has been well documented. **It is therefore recommended that this continuing neglect or near total absence of environmental impact assessment (EIA) of development projects must be reversed and EIA must become mandatory for all projects. In this EIA the malariogenic potential should be a key area of investigation and assessment. If required, this should be backed by supportive legal sanction.**

- The problem areas such as Hard Core Areas - Tribal areas mostly; Epidemic prone areas; Project areas; Triple Insecticide Resistance Areas and Urban areas will need both greater attention and very different responses. NMEP will have to become more flexible and local in its programme planning.

- Malaria which was predominantly a rural disease in India has now diversified into 5 ecotypes namely Tribal, Rural, Urban, Industrial and Border. These ecotypes and sub-ecotypes have their own special features and these must be adequately understood, analysed and monitored while malaria control programmes are planned. The malaria control strategies will have to be based on these epidemiological characteristics.

- **The understanding of epidemic dynamics calls for strict surveillance, maintenance of an adequate supply of drugs and an increasing epidemic preparedness in years of good rainfall.**

2.3 Strengthening the socio-cultural-economic-political dimension of problem analysis.

The overall emphasis on techno-managerial issues has completely fore shadowed what has been suggested as socio-cultural-economic-political-behavioural issues relevant to the community at risk. The malaria control programme has seldom involved a sociologist or anthropologist, to complement/supplement the research effort or to actively participate in a truly interdisciplinary way with problem analysis and problem solution. **Behaviour sciences approaches and socio-anthropological and socio-economic/health economic research competence must be urgently built into the 'problem analysis' and 'problem solving' structures at all levels.**

3. RATIONAL MALARIA CONTROL

3.1 Laboratory diagnosis of Malaria

- One of the biggest deficiencies in the entire malaria control programme is lack of scientifically functional diagnostic facilities at almost all levels of health care delivery. The important fallacies in the diagnostic machinary are (i) time lag between blood collection and examination (ii) absence of functionally viable microscopes, lack of their maintenance, (iii) lack of training on malaria microscopy of the lab technicians as well as the doctors attached to the health centres (iv) shortage of lab. technicians to the extent of 50 to 75% of sanctioned posts.

- Malaria is relatively simple disease provided it is diagnosed early and treatment started promptly. Most of the malaria deaths are due to delayed diagnosis and treatment.

- The suggestions include (i) Logistics for laboratory supplies should be streamlined; (ii) **In depth rigorous training for lab. technicians in malaria diagnosis; (iii) NGOs should be trained and supported to open peripheral laboratories, particularly in the remote areas and brought under the network; (iv) Developing trained supervisors for supervision of laboratory work and cross checking of the findings and (v) Setting up of graded laboratory facilities appropriate to different level of health care delivery system for early diagnosis, treatment and monitoring of complicated malaria even at the block level.**

3.2 Issues of Clinical Diagnosis

- Health personnel at various levels i.e. doctors, para-medics and health workers need

to be well trained in clinical skills which are appropriate for their level of confidence so as to be able to (i) diagnose Malaria early (ii) exclude other causes of fever (iii) diagnose complications of Malaria.

- It is therefore suggested that a key component of malaria control strategy is to upgrade the skills of Medical Officers and General Practitioners in Clinical Diagnosis through : Distribution of simple booklets on standardised modes of diagnosis and Continuing Medical Education (CME) Programme in collaboration with medical/nursing colleges, IMAs and other NGOs to update diagnostic skills among doctors, nurses and para-medical workers in both government and non-governmental health care delivery system.

3.3 Towards a Rational Drug Policy for Malaria

- It has been observed through the prescription survey that more than 90% of the anti-malaria prescriptions are irrational. This has been in part due to lack of awareness of the medical professionals about therapeutic aspects of the disease. This situation is leading to untimely exposure of the parasites to newer drugs and because of the continued and multiple drug pressure are prone to develop drug resistance. Chemoprophylaxis in the endemic area and presumptive treatment to any fever cases are to be looked into seriously in regard to their role in the emergence of chloroquine resistance.

- By and large, most of the aspects of the Treatment Policy on Malaria recommended by the Expert Committee set up by GOI/NMEP and mentioned in the Malaria Action Plan operational manual (1995)is endorsed. However MEG has strong reservations to the introduction of MEFLOQUIN into the Drug Policy recommendations at this stage. Clear policy statements are required on which anti-malarial drugs should be allowed in the market and under what conditions. This applies to drugs that are no longer recommended e.g. Amodiaquin and new drugs e.g. Mefloquine and and Artemenine.

- The results of the drug resistance monitoring must be made available to district health authorities and also to the medical profession in the respective areas.

- Adverse drug reaction monitoring of old/newer anti-malarials should be undertaken and post marketing surveillance by manufacturers of newer anti-malarials should be ensured.

- **There is need for NMEP to initiate dialogue with professional bodies, medical colleges and academic bodies to popularise their guidelines and reduce the existing confusion vis-a-vis treatment schedules, controversies and debates related to new anti-malarial drugs such as Mefloquine and the use of Sulfa-Pyramethamine combination drugs for chloroquine resistance strains. A major effort is required to incorporate these guidelines into medical (undergraduate and postgraduate) training as well as in the courses for nursing and allied health professionals and others.**

- G6PD deficiency and sickle cell anemia mapping should be done and made available to doctors in the affected region with warnings about anti-malerials and other drugs to be avoided.

- Proper prescription audits, medical audits and drug audits must be undertaken periodically and in-house prescription audits be encouraged.

- In endemic areas anti-malarials etc. should be available free (as mentioned in Malaria Action Plan 1995) or they should be very reasonably priced.

- Specialised centres for treatment of complicated malaria should be established in teaching hospitals of medical colleges.

- NMEP's stand on Ayush-64 (Ayurvedic preparations) should be made clear, which has been recommended after studies undertaken by the Central Council of Research in Ayurveda and Siddha.

- NMEP should publish its guidelines (at least once a year) on drugs/dosages/precautions/ indications and contraindications to scientific publications/guides which are routine reference for practitioners.

3.4 The 'Mefloquine' Issue

- The Malaria Expert Group (MEG) is deeply concerned on the introductionof Mefloquine at this stage in the National Drug Policy on anti-malarials because :

  - Cross resistance with quinine develops rapidly, so loss of effectivity of quinine due to mefloquine misuse especially when P.f infection are increasing in the country, it could lend to a major public health catastrophe.

  - Technically mefloquine has no advantage over other available anti-malarials effective for P.falciparum.

- As the gametocytes are not killed by Mefloquine, so a patient treated with Mefloquine will remain a reservoir of infection and a public health danger, spreading the infection in the community.

- In practice in the Indian situation it will not be possible to comply with the condition of 'compulsory laboratory report' by qualified parasitologists indicating that there are P.falciparum rings, which has been recommended by NMEP.

- Mefloquine is not recommended by the CDC (USA) for standby treatment in any situation. Breastfeeding by mothers taking mefloquine is contraindicated. Terotogenicity in animals has been noted and therefore it should be avoided in the first trimester. It is contraindicated for those with history of convulsions, psychiatric disorders, severe renal, hepatic dysfunction and cardiac conductive disorders.

- **Taking all those factors into consideration the permission to import Mefloquine will only facilitate unethical medical practice and promote misuse/overuse of a drug that should be kept severely restricted as the only second line against chloroquine resistance. It is therefore suggested that the decision to allow free import and use of Mefloquine should be seriously reviewed and the known factors should be reconsidered as part of the decision to restrict its use.**

3.5 Personal Protection Measures

Personal protection measures must be known to all the affected population to reduce the chance of mosquito bites and hence of contracting malaria. Promotion of such methods can be carried out to allow the people to select such measures according to their socio-economic status, culture, living habits and liking. Simple measures like wearing of adequate clothing after dusk to avoid mosquito bites, smoke fumigation especially burning of neem and/or tulasi leaves in houses before sleeping hour in sleeping rooms may be mentioned for the choice of the poor sections of the population. The efficacy of bed nets, for fever patients to sleep under as a malaria prevention measure for the family and the community needs to be highlighted. Encouragement of Neem and Citronella plantation as an environmental intervention measures for the family and community need to be highlighted.

3.6 Impregnated bed nets - some concerns

- Bed nets impregnated with synthetic pyrethroid insecticides @ 25 mg/sq m have been found useful depending on the biting behaviour of the local vectors and also the cultural habits of the population. It is suggested that :

  (i) Impregnated bed nets (IBNs) should be promoted as part of a multi-alternative programme and a multi-pronged strategy and not as the **only** option programme in any initiative, government or non-government.

  (ii) Studies should be done on their acceptability, feasibility and sustainability keeping particularly focus on the poorer section of the community.

  (iii) **They should be community based and community controlled and not topdown, subsidised or free distribution through the programme.**

  (iv) It must be remembered that a large majority of the population do not even have proper beds; are too poor to invest in nets; and overcrowding is not an uncommon problem. While family bed nets and impregnated curtains etc., may be appropriate alternatives - too much focus on 'impregnation' may divert attention from other methods/strategies.

  (v) It is important to distinguish between promotion of impregnated bed-nets/curtains through public education and their application as an intervention for malaria control, aiming at a certain level of coverage of a given population. It is essential that their efficacy under local conditions has been documented and that sustainability can be ensured.

3.7 Vector Control in Malaria Control Strategy

- The principal objective of Vector Control has been reduction of malaria incidence by reducing the level of transmission. Reliance in vector control is now being shifted from total dependence on insecticides to integrated vector control adopted to local situation.

- Some issues of concern are (i) Development of insecticide resistance among vectors of malaria, (ii) Environmental pollution due to use of insecticides for vector control is an increasing hazard, (iii) there is lack of adequate infrastructure and studies about the relevant environmental, ecological, social, economic and health service facilities for selective vector control in different areas, (iv) there is lack of effective inter-sectoral coordination with different department and development projects (irrigation, agriculture, flood control, public works, water supply and drainage system in urban areas etc.) for reduction in vector breeding, (v) there is lack of adequate entomological expertise required for the decision whether or not to use spraying in particular area, which insecticide should be used and when spraying operation should be done, (vi) there is lack of adequate trained qualified staff for sound technical management, (vii) upto now plans for spraying have been based on a single uniform criterion viz., a certain annual parasite incidence (API) without taking into account other epidemiological and social factors, (viii) Irregular treatment of the breeding places and lack of inspection at frequent intervals, (ix) there is lack of management information system and decentralization of decision making.

- The above areas of concern need to be looked into for appropriate strategies which include strengthening the vector control strategy primarily by enhancing capacity for selective, local/focal spraying with insecticide and bio-environmental control at all levels. Enhancing the state and local self administration capacity to ensure proper water and waste disposal and enacting model bye laws to implement the measures under the urban malaria scheme.

4. MALARIA AND PRIMARY HEALTH CARE

4.1 Malaria control has been integrated with Primary Health Centres (PHC). The multipurpose health worker, the lab technician and the health supervisors are the crucial operational team of the programme within the PHC organization. However, the crucial challenge is that malaria control becomes part of a Primary Health Care strategy only when the principles of (i) Community participation; (ii) Appropriate technology; (iii) Intersectoral coordination and (iv) Social equity become central to the strategy of the control programme. **The community needs to be actively involved in planning and implementing the strategy, accepting them as participants rather than beneficiaries of the programme and the strategy should be directed towards enabling/ empowering the community rather than just providing a service.**

4.2 Community Capacity Building

- To facilitate community capacity building the following activities are necessary :

(i) Providing complete knowledge on malaria, its causes, spread, treatment and prevention, (ii) Stressing the importance of early diagnosis and treatment. The community needs to be aware of the early signs and symptoms of malaria specially that of the early warning signs and onset of cereberal malaria, (iii) Providing early accessible treatment centres including knowledge of proven locally available herbal precautions and treatment, (iv) Identification and involvement of all human resources in the community including panchayat leaders, informal leaders, mahila mandals, youth clubs, teacher and school children, TBAs, General Practitioners including those of Indian System of Medicine.

4.3 Health Education in Malaria Control

A vigorous, effective and massive Health Education efforts need to be undertaken, using not only mass media but more significantly other strategies as well for the most vulnerable and high risk groups for the P.falciparum epidemics who are usually illiterate and have no access to radio or television. The measures include (i) **increasing the budget of health education, (ii) promoting folk media and community based interactive-culture sensitive approaches; (iii) involvement of media/communication centres in the government, voluntary and private sector, (iv) seriously initiating the inclusion of Malaria and other epidemic diseases in the school curriculum at various levels, (iv) focussing on making available and orienting most of the health education materials - existing and new production, in local languages, (iv) Campaign mode of door to door and village to village malaria education in the pre-monsoon season, depending on the onset of rains in the area.**

4.4 Role of the Voluntary Agencies in Malaria Control

- The role of NGOs especially the voluntary agencies (not for profit NGOs) is being increasingly recognised in planning and policy circles as effective complementary/ supportive strategy. Flexibility, availability and facilitating community participation have been some of the acknowledged strengths of Voluntary Agencies. A relevant and operational collaborative linkage between government and non-government initiatives in malaria control should be evolved by (i) active involvement of national health coordinating agencies of the voluntary sector, (ii) collateral linkage with other network of voluntary sector/focussing on development, environment, women issues and identifying specific role of the membership of such networks and (iii) **ensuring that the voluntary agencies are involved not only as alternative service providers but also as (a) health communicators, (b) community mobilisers, (c) alternative community health**

oriented training, (d) action and operational researchers and (e) issue raisers and awareness builders.

- The Voluntary Agencies (Volags) can play significant role in Diagnosis, Treatment of cases, Health Education and Vector Control. The central and state governments should involve the voluntary agencies in the planning, implementation and evaluation of the Malaria Control Programme. Health Education should be based on socio-economic and behavioural attitudes of the local community for which voluntary agencies working at community level are more effecitve. Volags should be actively involved in public awareness campaigns before the start of malaria transmission periods. Certain percentage of the budget should be earmarked for implementation of the programme through Volags and private sectors.

4.5 Capacity Building of Voluntary Agencies

- The capacity of Voluntary Agencies should be developed in the area of malaria control so that they can be effective in keeping the disease under control. The groups working in the field of health and development should be given training in (i) surveillance of fever cases and reporting of unusual occurrance of fever cases to the local health authorities for prevention and management of outbreaks, (ii) diagnostic skills in clinical and microscopic diagnosis of malaria, (iii) rational treatment presumptive as well as radical, (iv) health education and public awareness, (v) integrated mosquito vector control.

- Voluntary Agencies with commitment to the malaria control programme may be identified and developed as Resource Centres which will have trained human resources (malariologist, smear technician, microsopists, health educator), diagnostic equipment, treatment facilities and training infrastructure to train other personnel both in voluntary and private sector.

At the grassroot and the community based intervention level training costs should be incorporated into the regular NMEP budget and even state health budgets for training select personnel from Volag Resource Centres. A separate cell to deal with Voluntary Agencies and private sector may be established at NMEP both in Delhi and at the State Headquarters.

4.6 Role of Private Practitioners in Malaria Control

- It is estimated that nearly 2/3rds of the health care providers in rural and urban areas in India are private practitioners which include allopathic and other systems of medicines. It is surprising however that NMEP has not had adequate clarity and policy focus on the involvement of this sector in any active way. It is a matter of great concern that in the absence of a planned dissemination of relevant information and update on rational malaria diagnosis and treatment regimens utilising the generics/specifics available in the Indian market. The role of the Private practitioners community in malaria control is rather dubious and marked by increasing commercialization and unethical prescribing trends.

- **It is suggested that General Practitioners, Registered Medical Practitioners and other unregistered practitioners should be educated about the aims, objectives and functioning of the NMEP and to be oriented accordingly. Continuing Medical Education (CME) programmes should be organised involving IMAs, medical colleges and other professional organisations using uniform "Module" with minor regional variations wherever needed. Malaria treatment guidelines and other aspects of malaria may be communicated through publications in professional**

journals, bulletins, newsletters and/or distributed through booklets, pamphlets and handouts.

4.7 District Planning/Decentralization

Planning should be decentralized to district/PHC level by developing planning skills at that level. The Panchayat leaders should be trained/oriented to participate meaningfully in the health planning process. Evolving local Malaria Action Plan could be the beginning of this process.

4.8 Exploration/Study/Assessment of Role of the Indian System of Medicines (ISM) and their involvement

There is urgent need for: consultation/dialogue with experts of ISM on potentialities/ contributions of ISM to Malaria, study and strengthen local health traditions and practices that are relevant to malaria control, regular assessment and research of herbal and other alternatives, on orientation of the practitioners on Malaria and its public health related challenges.

5. TOWARDS A RELEVANT MALARIA POLICY

5.1 Malaria and National Health Policy

Programme and Policy planners in Malaria Control must actively study and contextualise the wider socio-economic-cultural-political context in which their strategies must be located. A broader context of public policy must therefore inform their deliberations, their understanding and their strategies for action, research, training and evaluation.

5.2 Health Humanpower Development and Training Issues

A humanpower development strategy for malaria control should promote (i) Provision and/or development of adequate trained staff at all levels of the programme; (ii) Re-introduce "Malariology" as a separate course as well as a module in medical/nursing, public health engineering education; (iii) Constant monitoring and supportive supervision as well as accreditation of training institutions associated with training of the programme team and (iv) Bringing in a policy of filling up vacancies, focus on high risk areas and rational transfers as well as supportive supervision of health cadres and lab. technicians.

5.3 Loss of Public Health Skill/Competence

The National Malaria Eradication Programme as well as all other health programmes in India is being greatly affected by the crisis of "Public Health" in the country, marked primarily by the increasing disregard of 'public health competence' and public health perspectives in health policy and health care decision making. At Central and State levels there is increasing marginalization of technical leadership with public health competence, by their clinical counterparts and both these groups by lay generalist administrators. Decisions that need sound epidemiological and technical background are now being increasingly taken by those who are not adequately qualified to do so. Specious arguments based on management/economic/or other extraneous factors are therefore being allowed to modify policy planning process. Therefore serious efforts be made to strengthen public health training and services in the country.

5.4 Malaria Research Challenges

There is urgent need for promoting operation and field research in Malaria Control particularly by focussing on socio-epidemiology; evolving an informal research process guiding network;focusing on an appropriate technology; and ensuring an efficient lab to field programme transfer .

5.5 Forecasting/Monitoring and Control of Malaria Outbreaks/Epidemics

The NMEP guideline for Mobile Epidemic Control Units (MECUs) at District level should be operationalised urgently. Concerted action to promote epidemic monitoring and or control/prevention at the field level and enhancing the epidemic preparedness at the district level is needed.

5.6 Management Information System

- **The existing MIS in Malaria should be reviewed to ensure that the whole system is simple, integrated and responsive rather than complicated, compartmentalised and bureaucratic.**

- A regular feedback based on the analysis of all data collected must be passed downwards to the field staff which shall help to (i) ensure that the collating agency reads and analyses the data to make the process relevant, promptly and regularly, (ii) enthuse the field staff in providing their relevant inputs because they identify their contribution to the management system.

5.7 International Public Health Collaboration

While promoting International Public Health cooperation it is necessary to have a watchdog committee of Government and members from Voluntary Agencies to evaluate every bilateral project to ensure that the project is geared to: (i) enhancing national capacity to deal with the problem, (ii) building national infrastructure especially trained and skilled multidisciplinary manpower, (iii) is rooted in approaches of strategies responding to local needs and socio-economic-cultural-political realities of the country and arising primarily out of local experience, (iv) preventing national strategies/projects becoming subservient to the priorities/ needs of international funding agencies, institutions and resource persons whose understanding of local socio-epidemiology is often rather limited and who may inadvertently promote to research, training and programme of their own institutions/agencies rather than being supportive of local expertise, (v) ensuring that project/linkage are transparent and subject to collective peer group dialogue and interaction among all those who are seriously involved and interested in 'malaria' as a public health problem.

5.8 Centre State Responsibility

States have failed to sanction and establish PHCs/sub-centres as per prescribed norm and also to match central allocation on 50:50 basis due to low priority to malaria problem and lack of resources. We believe that a time has come for a new policy alternative seriously establishing the primary/central responsibility of the states in the programme and devolving funds to that level also reorienting the central NMEP organisation to provide training and other supportive facility. Increased State government commitment to health infrastructure and health programme costs will greatly stabilise the programme and both responsibility and involvement will be generated simultaneously.

5.9 NMEP and Operational Management at various levels

- There is need to review all the operational aspects of the programme at all levels and making suitable mid course corrections and management/organisational modifications responsive to the local field realities including the suggestions given by expert groups from time to time. The State level organisation needs to be strengthened in the field of epidemiology and entomology and behavioural scientists to carry out periodic adhoc surveys in different areas for formulating effective control strategies in those areas.

- **Finally we need to ensure that Malaria becomes part of an integrated, people oriented, decentralised, enabling/empowering Health policy in which the people/ community become central to the whole policy framework.**

SECTION - A

SOCIO - EPIDEMIOLOGY OF MALARIA

THE PUBLIC HEALTH CRISIS IN INDIA

1. PREAMBLE

The Re-emergence of Malaria as a significant public health problem in the country since the 1970s and the increasing occurrence of outbreaks and epidemics especially in the 1990s, is leading to an urgent reappraisal of the countrys public health policy and a deeper understanding of the larger 'public health crisis that has been evolving in the country over the last two decades. Some elements of this crisis are:

1.1 The Socio-Epidemiological Imperative

There is a growing concern that the 'situation analysis and 'problem solving processes in the past, with regard to communicable diseases control strategies have focused predominantly on the techno-managerial aspects and less on the important socio-economic-cultural-political context of the problem.

There is therefore urgent need to strengthen these dimensions of problem analysis and solution so that a more comprehensive, effective, sustainable strategy is evolved to tackle the challenge of Malaria.

1.2 The Political Economy of Health

There is a growing concern in health planning and health policy circles that the 'market economy often drives policy decisions more significantly, than rigorous socio-epidemiological problem analysis. In National health programmes supported by International public health cooperation and collaboration, this also means that approaches and priorities are often promoted that are at variance from the recommendations of National expert committees and technical evaluation reports. These distortions taking place primarily because International public health linkages are themselves getting market determined.

It is therefore important to understand the political economy of health in a National and International context before evolving strategies / programmes.

1.3 The challenge of Decentralization

There is a growing concern that the country has reached the limits of National, centralised planning and with the recognition of the great diversity in situations and challenges at regional and state levels ***there is need for a more concerted effort at decentralised planning with a flexible framework that responds to regional needs and disparities in the health care situation.*** This is even more relevant to National disease control programmes especially when a disease like Malaria shows a diversity and focality in its epidemiology .

1.4 The need to move Primary Health Care beyond rhetoric to grassroots initiatives at community level

There is a growing concern that inspite of a National commitment to Primary Health Care and to integrated, comprehensive health care approaches, National health programmes are too vertical, too top down and inadequately integrated into the basic health services structure. This also means that policy alternatives or thrusts such as Decentralization and Panchayatraj; community participation; community based

approaches; involvement of general practitioners and the NGOs (both voluntary sector and private sector); inter sectoral coordination; and equity issues; are included in the formulation of strategies but remain rhetorical and not adequately translated into actual guidelines for action.

There is therefore need to promote community based approaches that ultimately strengthen the health infrastructure at the grassroots.

1.5 The Threat of the New Economics

There is a growing concern that larger economic issues be they corruption at all levels of the delivery system or the more recent trends towards privatization and commercialization and cutbacks in governmental expenditure on welfare is leading to a continuous worsening of the general health infrastructure and human power situation in the country affecting the sustainability and effectiveness of health care programmes. This is much more than just an infrastructural development or 'administrative/management lacunae issue and there is need to address this matter urgently since it affects all health and welfare programmes in the country.

The effects of the new economic policies need to be monitored carefully and the distortions in the planning process produced by market forces need to be countered.

1.6 The Urgent need for Right of Information

There is a growing realisation that health and development programmes in the country have failed to make the impact they were expected to, because of the failure to generate and sustain an awareness creation and educational process that would enable and empower the people and particularly the more marginalised sections of the community to access and utilize the services available and actively participate in the development and decision making processes for the further evolution and growth of such strategies. Without the spread of 'critical information leading to inadequate public participation programmes have floundered on inertia and red-tape. ***There is therefore need to support a process of demystification linked to the Right of information.***

1.7 The need to Widen the Dialogue and Participation in the Planning Process

In the light of all these background concerns and emerging needs for effective policy responses, and keeping in mind the urgent need to widen the dialogue and participation in the planning process, we have reviewed the Malaria situation and are offering certain complementary/supplementary comments and suggestions in all those areas where we feel there is need for newer perspectives and alternative approaches. We have drawn upon the resources of a wide network of individuals/groups who constitute an alternative sector eager to share their experiences and perspectives with the mainstream planning process.

By doing so we hope that the voluntary sector would have contributed to the development of some complementary strategies for action, to tackle the Malaria situation in the years to come and actively supplement the efforts of the NMEP by the evolution of more indigenously determined responses to problem analyses and problem solving.

2. LESSONS FROM HISTORY OF MALARIA CONTROL

The history of Malaria Control in India has been a history of concerted public health action under the leadership of committed 'public health policy planners supported by International public health cooperation. At this juncture, when the gains of this historical experience seems to be getting reversed, it is important to review the past and draw out certain lessons for the future so that we do not 're-invent the wheel and repeat today, what were unavoidable decisions of the past.

The most significant lessons from a review of the gradual evolution of Malaria Control activities in the country from the 1930s:

2.1 Recognising the potential of Sustained Public Health Action

From the situation in 1935, (when from a population of 300 million there were 100 million cases and nearly one million deaths) and the situation in 1947 (with reported 75 million cases and 0.8 million deaths) the malaria situation improved greatly by 1965 with 0.1 million cases and no reported deaths (!). This could not have been possible without the sustained, military campaign style of committed public health action that was mounted in the country backed up by a high level of public health competence and skill at all levels. Even though the situation has plateaued to around 2-3 million cases per year in a population of over 800 million, one must not lose the confidence that success has been demonstrated in the past and can be repeated, inspite of the financial constraints of a developing economy or the logistical challenges of a country as large as ours. This is particularly important to emphasise so that the present setback results in urgent action but not a knee-jerk alarm response!

2.2 Need for Competence in a Diversity of Approaches

The second lesson is that there is continuing need to maintain and build up competence in a diversity of approaches, so that relevant combinations of methods are used in a responsive way to suit the diverse epidemiological challenges of malaria in a country like ours. In the past, we have shown competence in bio-environmental methods, antilarval operations and other supplementary action before the advent of DDT and other adulticides. However, when DDT became the sheet anchor followed by other pesticides, there was a tendency to disregard development of competence in other methods with unfortunate consequence. This multidimensional approach rather than a unipurpose approach must continue to be emphasised. It is particularly relevant when International public health and the market economy are currently in the process of promoting impregnated bed nets as a panacea for all situations.

2.3 Need for a Synergy between the Political and Public Health Leadership in the Country

There is no doubt that till the mid 1960s there was an effective synergy between the political leadership and competent and assertive public health leadership in the country so that malaria control was supported by strong political will and facilitated by crucial public health competence at all levels. In recent years, this synergy has been broken by various factors including the changing values and competence of the political leadership; the marginalisation of public health leadership by lay administrators; the emergence of commercial interests and market forces in decision making and a gradual reduction in grassroots field oriented public health competence among the technocrats themselves. This lacuna needs to be bridged urgently.

2.4 Need for Solutions to Emerge in Response to Local Realities and Constraints

Competent public health leadership in the past asserted and ensured the development of local strategies based on quality research and trials in the country. International collaborative efforts supported these strategies strengthening infrastructural development and research competence. The malaria and tuberculosis programmes are particularly representative of this phenomenon. Regular evaluation and reviews by competent local health leadership had continued to stimulate policy change and relevant policy formulation resulting in programmatic shifts and new thrusts and approaches. This is an important lesson which should be kept in mind particularly today, when there are increasing trends wherein solutions developed in totally different socio-cultural-economic-political health care systems are foisted on National health ministries using the muscle of international funding often disregarding local expertise or experience. If this process continues at the cost of local 'problem solving and local 'solution generating efforts, the long term consequences will prove both costly and disastrous programatically.

2.5 Need to Recognise the Economic Advantages of National Health Programmes

Effective Malaria Control in India in the post independence years resulted in massive boosts to the economy especially agricultural development and industrial productivity. In 1947 the economic losses were estimated as 7500 million Rupees due to low output in agricultural and industrial sector including mining. Effective anti malaria operations converted the Terai in Uttar Pradesh, Wynad in Kerala and Malnad in Karnataka into the granaries of India. This 'economic advantage must be kept in mind today particularly when the new market friendly economic policy is in danger of considering health programme costs as 'expenditure and 'subsidy rather than economic investment.

2.6 Need to recognise and monitor key factors that have proved to be significant to the malaria situation in the past

During the wealth of experience gained in the earlier decades of control, certain factors proved to be significant to the problem of malaria incidence and control in the country. To name only a few - these include:

i. Large scale movements of population and/ or troops phenomena

ii. Aggregation or migration of labour for of development programmes

iii. Changing economic situation and its effects on health budgets

iv. The need for maintaining the morale and competence of health care teams at all levels of the system providing both effective guidelines and supportive supervision.

The increasing disregard of all these known factors is proving to be contributory factors to the present day setbacks and drawing from the past history, there is urgent need to monitor and respond effectively to these known 'lessons.

2.7 **Drawing from these lessons of history, the MEG therefore suggests:**

- ***A concerted attempt to make available to the present generation of planners and health action initiators - information and documents of past experience and strategies to inform our current efforts and policy.***

- ***A concerted effort to identify some of the 'veterans of these decades and try to involve them in evaluation, reviewing the current challenges so that we do not 'reinvent the wheel but learn from the past in our efforts to harness action for the future. (see Appendix J).***

> *The history of malaria contains a great lesson for humanity - that we should be more scientific in our habits of thought, and more practical in our habits of government. The neglect of this lesson has already cost many countries an immense loss of life and in prosperity.*
>
> *- Ronald Ross (1911)*

Case Study : Situation 1

Malaria in Gurgaon (Haryana)

(A November 1996 investigation)

[The Voluntary Health Association is a National Coordinating agency that links over 3000 grassroot-level organisations and community health programmes spread across the country. VHAIs primary objectives are to promote community health, social justice and human rights related to the provision and distribution of health services in India]

A VHAI Medical team visited Mewat region of Haryana recently where 1300 fever deaths had been reported from 36 villages with 6 lakh population!

Its findings and conclusions included:

- The region was an environmentally compromised area with very high rainfall of 1500 mm this year, floods from Rajasthan, poor drainage of water and low lying area resulting in water stagnation and increased mosquitogenic potential.

- It was an economically backward area with the floods having affected agricultural work. Large percentage of the locals belong to the minority community. Poor purchasing power made transport and medical costs a big burden in the recent epidemic. Many have spent Rs. 2000-3000 after having borrowed money!

- The breakdown of transport and communication resulted in the nonavailability of jeeps, ambulances to carry the patients to the services and also resulted in health teams not being able to reach the people causing increased malaria morbidity and mortality.

- Early deaths of the epidemic were reported as mysterious deaths. It seemed a severe epidemic of malaria with deaths occurring after 2-3 days of fever. Warnings to health personnel and the villagers came too late. Being poor they could not pay private practitioners and government centres did not have enough medicine.

- Health services were not geared to handle epidemics with lack of adequate mobile health services or laboratory back up.

- Many patients died in the villages inspite of taking quinine.

- During the floods few months ago, relief agencies had provided some relief but pulled out after the floods were over inspite of the apparent mosquitogenic conditions which made Malaria and Dengue highly probable.

- Environmental engineering measures to pump water from inundated areas, providing adequate drainage etc., are urgently needed.

- The areas had no NGOs involved in health care and Panchayat and schools were inadequately mobilised.

- VHAI - New Delhi, November 1996.

3. MALARIA SITUATION : THE PROBLEM OF UNDERESTIMATION

A major concern of our group is that the Malaria situation in the country has been and is continuing to be grossly underestimated, and that the existing epidemiological information available on the evolving situation is based on inadequately validated data.

Why do we say so?

3.1 Firstly, this concern is not new and has been first suggested in the indepth evaluation of the modified plan of operation of the NMEP in 1985. The observation was based on several reports of underreporting by the research organisations in the country.

3.2 Secondly, when NMEP estimates on malaria morbidity have been cross checked, to the extent possible on the basis of consumption of antimalarials especially chloroquin phosphate it has been suggested that a more realistic and safer assumption would be that ***20 to 30 million*** episodes occur every year as against the 2 million cases reported by NMEP.

Year	Malaria cases (in millions)	P.falciparum cases (in millions)	Deaths
1976	6.47	0.75	59
1984	2.18	0.65	247
1985	1.86	0.54	213
1986	1.79	0.64	323
1987	1.66	0.62	188
1988	1.85	0.68	209
1989	2.05	0.76	268
1990	2.02	0.75	353
1991	2.12	0.92	421
1992	2.13	0.88	422
1993	2.21	0.85	354
1994	2.49	0.99	1122
1995 (Provisional)	2.80	1.09	1061

Source : NMEP 1976-1995

3.3 The deaths due to Malaria reported annually by NMEP are between 200-500 from 1984 to 1993 with an increase to 1000+ in 1994 and 1995 (See table) . If crude death rate in the country is 10.8/1000 and of the 7.4% fever deaths, 0.8% are malaria fevers (GOI information) then on this estimation deaths would be expected to be 73795. Vital statistics of India collected separately also reported malaria deaths as 137,846 in 1985 and 75,285 in 1987 (NMEP figures were 213 and 188 respectively!).

3.4 There is growing evidence in the available data , that presently in most states, if blood examination rates go up, then the incidence of positives go up as well. This means that the present incidence recorded is modified by the lower slide examination rates and is not a true incidence but a gross underestimate.

3.5 A critical look at the table based on NMEP data shows that between 1984 and 1993 Malaria seems to have stabilised

- with 60-75 million blood examinations;
- 1.6 - 2.27 million cases of Malaria;
- slide positively ranging from 2.2 to 3.2%;
- Pf cases ranging between 0.54-0.57 million; and
- deaths ranging from 188-422.

3.6 While this has been interpreted as a certain stable containment - it does seem suspiciously stable/constant for a country with such diversity. It seems more likely to be explained by a certain built in stability in the surveillance system caused by human adjustment factors!. A more detailed study of the trends statewise and district wise may throw some light on this stability.

There is growing evidence that the present norms of slide-examination rates were based on situations when malaria incidence was low and hence, whereas the PHC staff are satisfied when they reach these figures, they actually are inadequate to help them identify outbreaks and epidemics through passive surveillance.

3.7 The NMEP surveillance system monitors Malaria incidence only from PHC sources. With recent estimates of the government health services forming only 35% of health care in India, it is obvious that the private sector including Gps and NGOs which provide the remaining 65%, handle most of the Malaria cases. They not only handle most of the first-contact care but with the progressively diminishing credibility of the government Primary Health Centres services in most states, less and less patients access the PHC services even for Malaria. In the absence of Malaria being a notifiable disease, any surveillance system which disregards the non-governmental sector is bound to produce a gross underestimate of reality.

3.8 In most of the states, the availability of laboratory technicians at PHC level are diminishing with vacancies of 50-75% not being uncommon. In such a situation, underreporting of cases will become the norm.

3.9 Many epidemics of fever that are malaria, and would be proven by lab facilities as such, are getting designated as 'mystery fevers. The lack of recognition of increase in Pf cases all over India is further aggravating the situation since cerebral malaria is misdiagnosed and all sorts of investigations are done and blood smear often taken as an after thought rather than at the first level of diagnosis.

3.10 PHC-MOs are often under pressure to soft pedal epidemic outbreaks because as per guidelines provided this mean additional initiatives and duties which the team want to avoid if possible, this being symbolic of the evolving work ethic. It is not surprising that in the recent Rajasthan epidemic some of these factors played a contributory role. Otherwise it is difficult to understand or explain how NGOs began to notice epidemic proportions of illness while the government saw it as sensationalization by media and NGOs rather than a failure of their surveillance and a lack of epidemic preparedness.

3.11 ***All these factors taken together contribute to a consistent under-reporting, which weakens and undermines the planning process. A very very important long term step is therefore to strengthen the epidemiological surveillance system so that the programme is able to plan on the actual magnitude rather than on an under-estimate***.

It is actually surprising how epidemiological analysis is done accepting the data at face value (as being valid) and yet privately, most health planners or health administrators, or medical officers at the district agree to the gross shortcomings of the existing reporting system and the built in manipulation and under reporting.

Therefore we suggest

- *Compulsory notification of Malaria cases and deaths must be introduced and every state and union territory should declare Malaria as a notifiable disease.*

- *Attempts must be made to improve the existing surveillance system and mitigation of some of the factors that lead to continuing underestimates.*

- *PHC staff and private practitioners must be motivated to provide a truer picture of the local situation of Malaria so that planning at all levels can be based on more reliable and valid data.*

- *As in the family planning programme, more recently, independent review and evaluations should be introduced so that the validity of NMEP data is constantly checked and counter checked.*

  This form of parallel surveillance could take many forms. e.g., theres a need to commission some independent and credible group of health enthusiasts to keep the Government system on its toes and to report back directly to state-level head quarters (something like the mobile checks for ticketless passengers on bus routes). They can check on early diagnosis prompt treatment (EDPT), active case detection (ACD), passive case detection (PCD) and any other indicator as well.

  This too could be multi-disciplinary and can change its thrusts area-wise, disease-wise and season-wise.

- *Active feedback on trends and programme implications of the monitored data, should be provided down the line to all groups who are involved in the surveillance operation. This will motivate them to ensure that data collected is more reliable and representative of the actual field reality.*

- *To reduce duplication of data collection and record keeping (the 'too many registers problem often at the front line workers end) some simple innovations and efforts at integration of records should be considered. (see Appendix for details of one such integrated and action stimulating record).*

> *India has its unenviable share of global incidences of malaria....Almost 2.5 million cases are reported every year of which the fatal falciparum or cerebral malaria claims over 1000 lives. India contributes about 40 percent of all malaria cases outside Africa.*
>
> *These figures do not reveal the entire picture, though the virtual collapse of the health surveillance and information systems in India has led to gross manipulation and underreporting of data by concerned authorities.*
>
> *—Down to Earth, 30-6-1996*

Case Study : Situation 2

Salient features of Malaria situation in Igatpuri, Maharashtra, 1996

[Voluntary Association of Community Health and Nurture (VACHAN) is a voluntary agency involved in Health and Family Welfare, Agriculture, Education, Animal husbandary and livestock activities in Nasik District in Maharashtra]

- Since July 1995, the area is considered to be malaria endemic area.
- Number of cases of Pf and Pv have shot up last year.
- People perceive malaria as 'fever with chills and correlate it to mosquito.
- People have accepted the need for spraying pesticide as a preventive measure.
- *Using mosquito net is not applicable because of cost and the method of sleeping together in a single room*.
- Traditional method to deter insects was the 'chullah using wood.
- *Patient suffering from malaria hardly access the services of the PHCs*
- The first contact care are private practitioners in the nearby market towns or the CHVs of our project.
- *No doctor except visiting consultants ask for a blood smear*!

  The practitioners give saline and injections Ciprofloxacin or injection Quinine. Chloroquin is commonly used as the anti-malarial drug. Next being Sulphadoxin.
- *The regime of chloroquin if given at all is almost always wrong*!

  Panchayats demand spraying as a formality each year but do not actively get involved in coverage and motivation.
- The government PHC infrastructure is good. Anti malaria drugs are adequately available.
- Training and Continuing education of health staff is satisfactory except knowledge of managing complications of pesticides other than DDT is poor.
- The Government PHC have not much health education materials. They have not carried out a single HE programme on this or any other theme.

VACHAN, Nasik District, Maharashtra.

4. EPIDEMIOLOGICAL ASPECTS OF MALARIA CONTROL

Issues and Dilemmas

The epidemiological features of Malaria in the country have shown a remarkable diversity and many new dimensions and factors have been described of late by NMEP /MRC and other research organisations. A review of all the available literature shows that there are some issues of deep significance and concern in the emerging epidemiological scenario.

4.1 Focal Phenomena

Malaria is now definitively proven to be an ***exclusively focal phenomena*** governed by presence of parasite, vector, susceptible hosts and suitable environmental conditions in the community. Its distribution and characteristics vary from village to village, city to city and even from area to area within a cluster of villages or a city/town.

The most important implication is that national and/or state level programme norms or guidelines need to be flexible and should allow diversity of responses to the diverse focal situations. As a disease phenomena therefore Malaria particularly lends itself to decentralised decision making and planning.

4.2 Parasites

In recent years, p.malaria is gradually disappearing while Pf which was more restricted in its distribution is now being reported from all over the country, especially in epidemic years. This spread is not adequately appreciated by health care delivery system leading to large outbreaks of epidemics of fevers often termed 'mystery fevers but nearly always proving to be epidemics of Malaria Of late a particularly virulent form of Pf seems to be occurring all over and cerebral malaria in all its florid manifestations is being reported consistently in most parts of the country.

There is urgent need to effectively monitor the spread of P-falciparum all over the country and evolve new guidance for this shift of parasite as well as the mixed nature of the situation and to communicate this information to all concerned actively.

4.3 Vectors

While 9 out of 51 species of Anopheles mosquitoes found in India transmit malaria, A.culicifacies the rural vector and A.stephensi the urban vector are the most significant.

Recent studies about 'sibling species are significant because even within the same vector there are subspecies A and B that are differently susceptible to different insecticides and develop resistance to different degrees etc. This information would help in selective spraying and other cost-reduction strategies.

While vector dynamics remain an important component, the inadequate or near absence of field oriented entomologists means that a major adjunct to policy analysis and solution is being neglected. The acute shortage of entomologists and the improper deployment or support to those who are in the public health system and NMEP is reaching a crisis situation which needs urgent policy redressal.

4.4 Climatic Factors and Seasonality

The interplay of temperature, humidity and rainfall on Malaria transmission is well known. So also is the fact of limited transmission seasons. However, some variations

in this seasonality do occur in the country e.g., in the North there is often a single peak over the July to October period whereas in the South, e.g., Karnataka, there are nowadays 2 peaks in May-June and October-November. This fact is particularly significant for the planning of control measures.

The 'EI Nino phenomena and its use to predict changing patterns in Rajasthan and other areas needs to be further studied to help with epidemic forecasting and thereby epidemic preparedness.

4.5 Urban Malaria on the Rise

Until recently malaria was thought to be a predominantly rural problem. The large scale resurgence of malaria and other communicable diseases like plague and dengue in cities has completely changed this scenario. Under the MAP 1995, 15 major cities including 4 Metropolitan cities, and 14 other towns in the country have been categorized as high risk urban areas where the malaria situation is serious and worsening. In some states, urban areas account for a major proportion of reported malaria. Chennai, for instance, accounts for nearly half of all the malaria reported in Tamil Nadu. Population explosion in urban areas, poor sanitation and environmental conditions, migration of people from malarious areas, poorly functioning Urban Malaria Scheme (UMS), unchecked development activities, and non-involvement of the private sector in malaria reporting and control have been some of the reasons for the worsening urban malaria situation in many parts of the country. ***One of the major problems in the UMS is that the responsibility of implementing them lies in the hands of local bodies like municipalities and corporations. In most urban areas, local bodies plead lack of resources for doing a poor job in malaria control. A large number of UMS posts remain vacant; blood smears remain unexamined for months to end; fogging and space spraying operations are done only when there are outbreaks; larviciding operations are conducted without any evaluation or monitoring - in fact, in some areas, vector breeding has been documented in wells where larviciding (with Abate) have been carried out! (presumably because Abate is not used in the correct concentration and dose)*** [see Case Study 3a].

Case Study: Situation 3a

Malaria in Vellore Town, Tamilnadu

Vellore, a town of 2 lakh population, is the HQ of North Arcot Ambedkar District in Tamil Nadu. Till about 1991 the town was considered to be free of indigenous malaria. In 1992, based on reports of cases with no history of travel, Vellore was declared endemic for malaria. Since then the malaria situation in the town has worsened steadily. Data from the UMS reveal that between the years 1977 and 1992, the API had varied between a low of 1.22 and a high of 3.95. In 1993 it shot up to 9.41 and reached an all time high of 12.01 in 1995. Local transmission of chloroquin resistant falciparum has also been documented in Vellore.

- Malaria has become endemic in Vellore Town since 1992.
- Most of the cases currently are indigenous and falciparum cases have also increased gradually over the years
- Active breeding of An. stephensi was identified in many of the sites with cisterns and small containers being the most important sites of active breeding.
- There was widespread awareness among locals about the existence of the municipal dispensary for malaria diagnosis and the availability of treatment.
- Radical treatment was being given almost immediately to most cases.
- Recurrent weekly larviciding with Abate was being done in most houses. Interestingly some wells were breeding Anopheles despite the recurrent weekly larviciding (!)
- Almost no household used personal protective measures regularly.
- Water storage for long periods in all kinds of containers during water scarcity periods in summer encouraged breeding.
- The human population density of the town was very high. Malaria, however, was endemic mostly in the poorer sections of the town.

CHAD - Christian Medical College, Vellore, Tamilnadu.

4.6 Migration and Malaria

A very significant feature of Malaria epidemiology and transmission is the links between population migration and malaria transmission. Labour migrating from malarious and non-malarious areas bringing about mixtures, of immune and non-immune populations coupled with local, important parasite reservoirs results in focal outbreaks of malaria which are getting commoner and are often 'explosive. The whole 'development model adopted by India has been responsible for 'migration becoming an increasingly significant factor.

- Labour migration for agriculture, fishing, mining and cattle grazing are known.
- Labour migration for urban jobs especially construction and road building have increased sharply in recent years due to inability to sustain oneself in the villages.
- Migration of population during calamities like cyclones, earthquakes, drought and famine and more recently during the plague epidemic and also the communal riots.
- Migration for construction of development projects - dams/bridges etc.
- Migration due to displacements by development projects e.g., dams and mining.
- Migration from neighbouring countries.

While these are known factors the public health system still has no organised surveillance system to monitor the migration and be prepared for its implications. This is an urgent need for some effective form of monitoring as an inter-sectoral coordinated effort of the ministries of Health, Labour, Agriculture, Irrigation and Power etc., to be set up soon.

At present after outbreaks have taken place, firefighting operations carried out after the event lead to the gradual discovery of these causative factors. A more active surveillance would not only increase the public health systems preparedness but also help to evolve strategies of control and prevention for predictable problems.

The Rajasthan epidemic is a typical case where population migration from malaria endemic regions and increased malariogenic potential caused by the construction of Indira Gandhi Canal System produced what was perhaps an 'avoidable tragedy. While the importance of migrants in disease transmission is well known, the health problems of the migrants themselves is usually not addressed. Migrants most often work in the unorganized sector and governmental programmes do not cater to their health needs; nor are they are of interest to the private sector. When migrants are found to transmit disease, the intervention is usually control of migration rather than control of the disease. [see Case Study 3b].

We suggest that a clear policy on migrants and their health care be drawn. Migrants should be considered a high risk population and be screened and treated for malaria whenever they move from one work place to another. The responsibility of this task could lie with their employers and legal statutes to this effect could make this procedure mandatory.

Case Study: Situation 3b

Migrant malaria in Vellore Town

Malaria situation in Vellore has been steadily worsening since 1991. One of the peculiar feature of this town is the fact that it has one of Indias largest tertiary hospitals: the Christian Medical College Hospital. Each day nearly 2000 patients are seen in the OPD. Many of these patients are from northern states like W. Bengal, Orissa, MP and Assam. In addition, construction activities and development work attracts labourers from several states. A study done in 1996 brought out the possibility of imported cases being an important cause of the worsening malaria situation in the town.

- On 14th March 1996, a group of 48 migrant labourers from the districts bordering on Andhra and Orissa reported to CHAD hospital of CMCH. They were all acutely ill with fever, rigors and lassitude. 41 of this group was diagnosed to have malaria (more than half were falciparum). The general condition of these migrants was very poor and nearly 80% of the group was anaemic.

- This group had arrived in Vellore on 3rd March and was working for the subcontractor for a construction company. Though many in the group had begun to manifest symptoms within a week of arrival in Vellore, they were denied access to health care. It was only when most of them could not work, they were referred to the health centre.

- While presumptive treatment was given for all the cases, adequate radical treatment could not be administered because the group was evicted from the town by the subcontractor without the knowledge of the health team.

- The study brought out the poor health status of these migrants and the difficulties they had in accessing health care. It also highlighted the dependency of these migrants on their employers for even basic needs.

- From the public health view point, this group was a large reservoir of falciparum malaria in an area not considered endemic for falciparum. The fact that they were from an area known for chloroquine resistant malaria raised concern about the spread of drug resistant malaria in a vulnerable population.

- Mass blood smears taken from those living close to this group revealed 32 more cases (out of 108 smears examined; 13 vivax, 13 falciparum, and 6 mixed). Though these new cases could not be definitely linked to the migrant group, the potential for malaria transmission was clearly brought out.

- The study highlighted the need to consider migrants as a high risk, vulnerable group with unique health problems and needs.

CHAD - Christian Medical College, Vellore, Tamilnadu

4.7 Development Projects and Malaria

The Mosquitogenic potential of large development projects-be they dams, irrigation/ canal systems, bridges, laying of roads and railway lines etc., or establishment of large industries has been well documented in the past.

This mosquitogenic potential arises not only from the population migration/aggregation factor described in (5) but also from environmental changes - including water logging, seepage from the system ecological changes due to opening of new areas to agriculture, conversion of dry lands to wet lands etc. Poor housing or temporary facilities for the migrating work population and poor management of water supply, sanitation and waste disposal in areas of their aggregation further worsen their problem. In the early days before the advent of DDT, the Malaria Control Programme monitored the mosquitogenic potential and introduced measures to prevent the potential by pre-project environmental impact assessment and suggesting modifications or initiatives to reduce the potential. With the advent of DDT, all these have completely stopped inspite of a much more active and aware environmental lobby in the country. This is particularly disturbing.

We therefore strongly recommend that this continuing neglect or near total absence of environmental impact assessment of development projects must be reversed and EIA must become mandatory for all projects. In this EIA the malariogenic potential should be a key area of investigation and assessment. If required, this should be backed by supportive legal sanction.

Resourceful and technically competent groups in the voluntary sector should build up the capacity to undertake EIA to add an increased objectivity in the whole issue of development monitoring.

4.8. Regional Diversity and Disparities

The Malaria situation in recent years has become very diverse and complicated with different states experiencing different trends and sometimes regions within the state also showing different trends. Whether it is incidence of malaria as such, or the relative incidence of Pf and Pv, or the experience of explosive outbreaks and epidemics - there is an increasing diversity which needs to be appreciated. ***This phenomenon calls not only for an active surveillance and monitoring strategy but for programme planning with flexibility to meet the needs of different regions*** ***(See Appendix A)***.

Regional decentralised planning of Malaria Control activities will be the logical corollary to this situation and will become increasingly needed. In response to this NMEP will have to be increasingly willing to share expertise and information at the regional state/district level and also build up the capacities for such decentralised planning at those levels.

4.9. Problem Areas

Malaria is endemic in India and active transmission has been reported from almost all areas except those above 2000 msl and the coastal belts on western ghats. Some areas have very low receptivity like the State of Kerala and North Bihar. Malaria in India is largely unstable and therefore comes in waves after an interval of several years depending on immunological environmental and meteorological factors. 5 types of problem areas have recently been identified (See Appendix B). These include:

- ***Hard Core Areas*** (Tribal areas mostly).

  The recent proposal to World Bank is primarily focused on these areas.(seven North Eastern States are in this area and 87 districts of BIMARU and Orissa, Maharashtra and Andra Pradesh states.

- ***Epidemic Prone Areas*** -

  North Western and Indogangetic plains are typical.

- ***Project Areas***

  Development projects all over the country. This is bound to increase greatly in the next few years unless environmental impact assessment is strictly carried out at preplanning stage and measures to reduce malariogenic potential are carried out.

- ***Triple Insecticide Resistant Areas***

  This is a newer problem with A..Culicifacies having become resistant to DDT, BHC and Malathion in the western belt especially in the northern parts of Maharashtra and Karnataka and Southern Gujarat. Such areas may need indoor residual spray with synthetic pyrethroids or bio-environmental control measures.

- ***Urban areas***

  While 15 cities (see Appendix B) have been found to account for 80% of urban malaria, the malariogenic potential of all cities and towns in the country seems to be increasing and the corporation authorities are doing very little to improve the situation. The urban crisis may soon prove to be a very major crisis if left totally unchecked, as at present. (see also section 4.5)

  The problem areas will need both greater attention and very different responses. The increasing challenge to NMEP will be to become more flexible and local in its programme planning.

4.10 Malaria Ecotypes

Malaria which was predominantly a rural disease in India has now over the years diversified into 5 ecotypes with sub ecotypes - mainly comprising of man made changes in the ecology favouring vector breeding and areas of undisturbed ecology largely in the forests and regions of rainfall agriculture. The ecotypes are Tribal, Rural, Urban, Industrial and Border. These ecotypes and sub ecotypes have their own special features and these must be adequately understood and analysed and monitored while malaria control programmes are planned. This classification is a broad one to understand malaria paradigms at a national level but at the field levels one often finds a certain overlapping between them rather than distinctive distribution.

The use of the concept of ecotypes and subecotypes will be increasingly relevant in the years ahead and malaria control strategies will have to be based on these epidemiological characteristics.

4.11 Malaria Epidemics

Epidemics occur in unstable malaria areas and may bring death and panic. Furthermore there is an imminent fear of spreading the problem of drug resistance. Therefore, timely detection and liquidation of resurging foci should be given immediate attention for control and aborting the epidemic. It has been repeatedly observed that outbreaks/ epidemics occur because of the breakdown in surveillance and shortage of drugs for extended periods resulting in accelerated transmission during the years of good rainfall.

If an epidemic is predominantly of *P.vivax* infection, then it is certain that first round of insecticide had not been given in time as scheduled or coverage was poor. Further the case detection/drug distribution was not done for atleast 2 or 3 months.

If an epidemic with ***P.falciparum*** predominance is seen with deaths of microscopically confirmed ***P.falciparum*** cases, then both rounds of insecticidal spray were either not given or coverage was extremely poor. Further case detection and drug distribution were not done for atleast 4 to 5 months.

The understanding of epidemic dynamics in recent years calls for a commitment to strict surveillance, maintenance of an adequate supply of drugs and an increasing epidemic preparedness in years of good rainfall. The increase of Pf, infections in many places is resulting in a 'crop of mystery disease epidemics characterised by diverse cerebral symptoms that are often not being properly identified as Pf. This needs to be monitored seriously and actively.

4.12 Problem of Drug Resistance

Resistance to chloroquin in p-falciparum were first reported in the North East (Assam, 1973) but now it has slowly spread to many other parts as well. Even in areas where chloroquin resistance has been demonstrated - the entire population of p-falciparum is not totally resistant, but three degrees of resistance have been demonstrated (R-I, R-II, R-III). While R-III means total resistance fortunately areas with it are still few. NMEP has been gradually mapping the resistance problem but this data is not yet adequately shared or communicated to the health care practitioners to help them modify their treatment schedules and treat resistant forms actively with alternative regimens.

This sharing and distribution of information will become a crucial challenge in the years ahead.

4.13 Mixed Problem with other Vector Borne Diseases

While this is outside the scope of this report the distinctive distribution of different vector borne diseases in the past is getting changed with overlap becoming more common especially in urban areas and areas where environmental changes creating potential for vector borne diseases is enhanced. Dengue and Malaria, Malaria and Kalazar etc., are now commoner even though the vectors are different. ***This mixed infections in an area will become a new challenge for the public health system and therefore it is important that in preparation the vector borne disease national programme should begin to coordinate and collaborate more closely in the years ahead***. This is already taking place but needs to be followed up more actively.

In conclusion - the changing nature of malaria epidemiology calls for an active surveillance/monitoring strategy and an active information sharing strategy by NMEP/MRC with all those who contribute to malaria control programme directly or indirectly in both the governmental and non-governmental sectors, so that programme responses are more relevant and effective.

5. STRENGTHENING THE SOCIO-CULTURAL-ECONOMIC-POLITICAL DIMENSION OF PROBLEM ANALYSIS

From time to time the Government of India and NMEP have invited experts inside and outside the system to monitor, evaluate, review, appraise the Malaria Control Programme, to identify programme lacunae and make suggestions for improvement; revision of strategy; mid course corrections; modification of approaches; or development of new or alternative approaches.

A review of the key documents has helped us to understand the evolutionary history of the control programme and we would like to record our appreciation for the serious and relatively comprehensive nature of all these exercises. The National Task Force Report of 1993 is a particularly significant document.

However, the review has identified two issues of emerging concern.

5.1 Techno-Managerial Preoccupation of Problem Analysis and Assessment

The overall focus and emphasis of all the review initiatives are focused on ***technical issues*** such as treatment schedules, problems of resistance in the mosquito and human subjects, choice of pesticides, efficacy of methods, research challenges on the one hand or ***managerial issues*** such as programme organisation, human power development, logistics and supplies, management information system, monitoring, evaluation and supervision on the other hand. These have been classified as Technical, operational, administrative, financial. While all of them are very relevant and some have been crucial for programmatic change, the overall emphasis on techno-managerial issues has ***completely foreshadowed what we would like to suggest as socio-cultural-economic-political-behavioural issues relevant to the*** community at risk.

The focus has been on the Mosquito, the Parasite, the Health care delivery system, the Environment and Ecology but the focus on the patient/community at risk (the Human/ Community factors) has been neglected. The expertise of the Behavioural Sciences especially the socio-anthropological and the socio-psychological dimensions at work in Malaria have been grossly neglected. So little is known after so many decades about the knowledge, attitude and practices of the diverse communities in the country in rural, tribal areas and urban slums - of malaria and malaria control related issues. The NMEP and or MRC or for that matter any other organisation or team studying the malaria control programme has seldom involved a sociologist or anthropologist, to complement/ supplement the research effort or to actively participate in a truly interdisciplinary way with problem analysis and problem solution.

The efforts of VCRC and MRC to study and operationalise the factor of 'Community Participation' in Malaria and Communicable disease control have been significant contribution but in the absence of multidisciplinary behavioural sciences competence even in their research teams this dimension has remained somewhat peripheral and marginalised, in their otherwise, very competent responses and initiatives.

The recent work of the Tata Institute of Social Sciences on the socio-anthropological dimensions of urban malaria in Bombay and the involvement of such expertise (though somewhat marginally) in the NMEP's Surat research project more recently are important steps in this direction.

At a policy level this lacuna has meant that, in a series of new concerns and thrusts that are included in Expert group reports in the recent decade the practical guidelines for action have not emerged and the whole thrust has been ***rhetorical*** and on paper.

These have included

1. Primary health care approach
2. Community participation through improved IEC
3. Decentralisation of decision making
4. Malaria control through Zilla Parishad and involvement of Panchayats
5. Promotion of indigenous and locally available technologies
6. Involving private sector, NGOs and voluntary agencies
7. Intersectoral coordination
8. Sustainability

Behavioural sciences competence is urgently required if any or all of these have to become real field level thrusts!

5.2 Neglect of Health Economics

The second lacuna of the expert reviews has been the singular lack of involvement of Health Economists in the whole exercise. In the absence of a deeper economic analysis of alternatives and choices and in the absence of adequate understanding of cost-benefit, cost-effective analysis and factors such as opportunity costs; assessment of economic losses and productivity losses due to existing situation; and the predicted improvement due to effective programme gains; the programme development has been hampered by adhocism and competing professional expertise not based on objective economic criteria.

The active involvement of health economists in planning and monitoring strategies would ensure that investments in malaria control can be established as having economic sense and providing health equity. Research into factors such as existing health expenditure patterns in malaria at individual, family/ community/district /state levels etc., also need to be promoted.

We recommend therefore that Health Economists must be actively identified and involved in situation assessment and programme planning so that decisions about choices and alternatives, and effects, are based on more rational economic and socio-cultural indicators.

However , we would caution that the 'economic' criteria should not supersede other criteria and costs should not become the determining factor at the cost of social need and equity issues. The plea is for 'economics' to be an important complementary part of the planning process but not the central core.

5.3 There is Therefore an Urgent Need to Respond to these Lacunae and we Suggest the Following:

- *Behavioural sciences approaches and socio-anthropological and socio-economic/health economic research competence must be urgently built into the 'problem analysis' and 'problem solving' structures at all levels - NMEP headquarters, MRC, VCRC research centres and at State directorate levels to ensure that these dimensions are no longer ignored.*
- *Well planned, multidisciplinary action/operations research must be initiated and a more wholistic effort strongly rooted in the social sciences must be encouraged.*
- *From Action/Operations research practical, realistic operational guidelines can be evolved on all the above areas and these then incorporated into the planning process, the training process and the action process at all levels.*

Malaria Control - Critical Social Questions

1. The existing knowledge, attitude and practice of communities on issues of malaria and malaria control and the gaps between community perception and programme perception.

2. The class/cultural gap factors between the leadership and the masses that allowed vertical programme strategies to overshadow the development of a network of permanent basic health services.

3. The role of large scale labour and community migrations (endemic areas to region/ districts) as causes for outbreaks and re-emergence? The causes of such migration.

4. The effects of privatisation of DDT spraying operations on control strategy effectiveness.

5. The effects of budgetary cuts on programme strategy and effectiveness.

6. The role of military background and colonial value orientation of health administration in the formulation of vertical programme strategies

(Banerji, 1995)

[These are some of the broader questions that would be answered if the sort of behavioural science component is included in the existing multidisciplinary team]

Case Study : Situation 4

Malaria in Santal Parganas in Bihar

Salient features

[EIFM hospital is a small mission hospital in Pakur in the Santhal Parganas region of Bihar. The Case Study is based on the observations of a doctor supporting community health clinics in the area.]

- Malaria is referred to as 'Raban rua' (cold-fever). Cerebral Malaria is called 'Bai' or 'migri'.
- Malaria fever attacks are noticed as often taking place after hard work! or events like 'change of water'!
- DDT spraying is objected to by the locals because (i) it smells (ii) sprayers are 'Dikus' (non tribals) (iii) they do not know tribal culture (eg., enter houses wearing shoes)!
- The PHC laboratories hardly function. Results are very late in the one or two PHCs that have technician.
- Antimalarial drugs are currently available.
- As an NGO I got 500 tablets of chloroquin for a subcentre covering 3000 population. Also 10 slides. 2 sewing needles, (but no access to a technician).
- Government pesticides when available are often past the expiry date.
- Chloroquin is generally available in the market for Rs.1/- per tablet. One shop in areas stocks Quinine, Primaquin, and Pyrimethamine combinations. Injectable chloroquin is available in PHC/ block towns.
- Most PHC staff would treat a fever with antibiotics. If the patient mentions cough, they are given a weeks Rifampicin from a private pharmacy and sent for an X-ray.
- If Malaria is diagnosed the standard treatment is an injection of chloroquin (2-5 ml i.e., 80-200 mg chloroquin) and a few tablets (1 tablet twice a day)!!
- General practitioners are usually PHC staff (Doctors or others working privately either during or outside official PHC hours).
- Compounders (Jhola Doctor) always give injections - ampicillin and tetracyclines but also give chloroquin and visit villages and homes.
- In the rainy season or at night, they are available and on call and charge according to seriousness of patient (relatives of unconscious / weak patients will readily shell out Rs.500-00 to save life).
- Tribal opinion and leadership is developed through consensus. Decisions require consent of all adults (some stress on males) and therefore tend to preserve status quo.

- EJFM Hospital , Pakur, Bihar.

SECTION - B

RATIONAL MALARIA CONTROL

6. LABORATORY DIAGNOSIS OF MALARIA-SOME ISSUES

One of the biggest deficiencies in the entire malaria control programme is lack of scientifically functional diagnostic facilities at almost all levels of health care delivery. Of all the fallacies in the diagnostic machinery, important ones are:

1. time lag between blood collection and examination
2. supply of sub-standard laboratory materials, particularly the fungus infected frosted glass slides
3. absence of functionally viable microscopes, lack of their maintenance, poor knowledge of their handling and maintenance
4. lack of training on malaria microscopy of the lab. technicians as well as the doctors attached to the health centres
5. inadequate man-power. (presently shortages of lab technicians are to the extent of 50-75% of sanctioned posts!)

It is to be noted that there is still no replacement to the microscopic examination of the stained blood films in the diagnosis of malaria. Often thick smears are not examined (which is 25 times more sensitive than a thin smear) due to lack of expertise. Liquid paraffin is mostly used in place of Cedarwood oil leading to poor resolution. Blood smears are not properly drawn and preserved. Sometimes there is time lag of more than 2 months and the smears are kept unfixed (unpreserved) leading to degeneration of cells and the parasites as well as growth of contaminating fungi and bacteria, particularly in the rainy season resulting in either false positive or false negative results. Besides there are many other technical defects in the laboratory practice of malaria diagnosis.

Ideally Giemsa stain should be used to provide best result. NMEP recommends JSB Staining as being appropriate and practical for field situation. If Giemsa and JSB stain are not available, then Leishman stain can be used. The comparative advantages and disadvantages between the three stains are enumerated in Appendix C.

[Antigen detection technique has its own limitations and should only be preserved for academically interesting cases. However, the World Bank sponsored project is likely to test out the efficacy of dipsticks in some project areas (!).]

Recommendations

A. Improving Techniques

1. Malaria blood smears should be fixed in methanol to prevent degenerative changes and microbial contaminations.

2. Time lag between blood collection and examination must be brought down to 24 -48 hours.

3. Laboratory technicians must be instructed to mention the species and the stages of the parasites detected.

B. Enlarging the Quantum of Diagnostic Facilities by Establishing Wider Network of Facilities with Non Government Facilities

1. NGOs should also be involved in the malaria diagnostic procedures and may be encouraged to establish their own laboratories. (Similar to NTP involving peripheral health institutions and subsidising costs for AFB examination of smears)

2. Private laboratories should be encouraged to establish diagnostic facilities and

send monthly malaria report to the concerned authority. The licence should not be renewed without this condition.

3. Laboratory technicians attached to NGOs and private laboratories must have obtained appropriate training to the satisfaction of the NMEP.

4. Regular strict supervision and cross-checking should be done for the NGO and the private laboratories. If needed necessary legislations may be made to bring the private laboratories/NGO labs within the purview of NMEP.

C. Enhancing Training Facilities / and their Accreditation

1. Most importantly the laboratory technicians (both government as well as private) are to be trained. It is necessary to bring out simple standardised manuals/booklets for training technicians. These manuals could be translated into local languages and adopted to suit local needs and realities. At present there is no standardisation of the laboratory technicians training programme and recent trends towards commercialization are further worsening the problem.

2. An Allied Health Professionals Council at National level which will include under its purview lab. technician training courses is an urgent need. There is no other long term way to enhance standards and quality of training.

D. Increasing the Manpower

1. However most important step of all is to recruit and place lab. technicians where they are needed most. If current lab technicians training programmes are standardised and certified - the manpower from a wider range of institutions can be tapped by NMEP and State governments to fill up existing vacancies in the services.

E. Improved Infrastructural Facilities for Early Diagnosis and Proper Management

1. Contrary to the belief, malaria has been observed to be relatively simple disease provided it is diagnosed early and therapy started promptly. Most of the malarial deaths are due to delayed diagnosis and treatment. It has been observed with great pain that prompt diagnostic facilities (reporting on the same day) in the country is virtually non-existent, particularly at the peripheral level. Reports often reach the source after the death of a patient. At the Primary level, there are hardly any microscopes with good oil immersion lens, and dependable malaria microscopists have become a rare breed. Logistics of supplies for laboratories has become a victim of bureaucratic mismanagement. Existing reporting system still continues to use outdated formats having no practical utility.

   Number of peripheral laboratories under Government control remained static for decades, inspite of enormous population growth. Unmanned/inadequately manned laboratories, lack of infrastructural support, lack of appropriate supervision and cross-checking have all added to the ever increasing magnitude of problems and virtual effective functional closure.

Suggestions :

- *Mechanism of logistics for laboratory supplies should be made user friendly.*
- *In depth rigorous training for lab technicians in malaria diagnosis.*
- *NGOs may be trained and supported to open peripheral laboratories, particularly in the remote areas and brought under the network.*
- *Developing trained supervisors for supervision of laboratory work and cross-checking of the findings.*
- *Setting up of graded laboratory facilities appropriate to different level of health care delivery system for early diagnosis, treatment and monitoring of complicated malaria even at the block level.*

7. ISSUES OF CLINICAL DIAGNOSIS

PREAMBLE

Malaria continues to be a cause of pain, suffering and needless deaths. Failure of early diagnosis, problem of overdiagnosis, underdiagnosis, along with inadequate and improper treatment add to the suffering, economic wastage of scarce resources and also emergence of drug resistance. Absence of/ or poor back up of lab facilities has made rational treatment more difficult, so also the lack of adequately trained health personnel.

Health personnel of various levels i.e., doctors, para medics and health workers need to be well trained in clinical skills which are appropriate for their level of competence so as to be able to

- diagnose Malaria early
- exclude other causes of fever
- diagnose complications of Malaria.

This would require

- Skills in good history taking (i.e., knowledge of clinical presentation of Malaria, as well as communication skills, gender sensitivity).
- Clinical skills in good, thorough, physical examination (knowledge, skills, respectful attitude towards patients specially women) .

Tools for this would be:

- Checklist for history taking
- Functional Diagnostic flow chart - Algorithm (easy to read in regional language)
- For confirmation of diagnosis, laboratory back up services with appropriate equipment and trained personnel would be required to ensure proper diagnosis and rational therapeutics.

We therefore suggest that a key component of malaria control strategy is to upgrade the skills of Medical Officers and General Practitioners in Clinical Diagnosis through

- *Distribution of simple booklets bringing together standardised modes of diagnosis which mentions check lists and provides a diagnostic flow chart.*
- *CME Programmes organised by NMEP in collaboration with IMAs and medical/nursing colleges and to highlight and update diagnostic skills among doctors, nurses and even paramedical workers in both governmental and non-governmental health care delivery system.*

8. TOWARDS A RATIONAL DRUG POLICY FOR MALARIA

As indicated early, the escalating problems of malaria are mostly man made and iatrogenic, particularly, the complications and mortalities. ***It has been observed through prescription surveys that more than 90% of the antimalaria prescriptions are irrational***. This has been in part due to lack of awareness of the medical professionals about therapeutic aspects of the disease. There has been no effective National Drug Policy for the sale of antimalarials. As a result presently unwanted drugs are getting smuggled in the country and are being used widely. This situation is leading to untimely exposure of the parasites to newer drugs and because of the continued and multiple drug pressure are prone to develop drug resistance.

Chemoprophylaxis in the endemic area and presumptive treatment to any fever cases are to be looked into seriously in regard to their role in the emergence of chloroquine resistance.

A strong campaign should be made to preserve antimalarials in the line of "Save oil" and "Save environment, campaigns". People including the doctors must be convinced that drugs are one of the most precious materials in the Earth and they should be used judiciously and should be preserved for the future generations.

By and large, we endorse most of the aspects of the Treatment Policy on Malaria recommended by the Expert Committee set up by GOI/NMEP and mentioned as guidelines in the Malaria Action Plan operational manual (1995). We also appreciate the recommendations of the same Committee on Rational Drug Policy for Malaria. However, we do make some suggestions for the 'expert group' on Drug Policy and NMEP authorities to consider.

8.1 We have strong reservations to the introduction of MEFLOQUIN into the Drug Policy recommendations at this stage and this is a unanimous position (see details in next section (B-9) specifically focused on Mefloquin issue).

8.2 Clear policy statements are required on which antimalarial drugs should be allowed in the market and under what conditions. This applies to drugs that are no longer recommended e.g., Amodiaquin and new drugs e.g., Mefloquin and Artemesine.

8.3 If a choice between Mefloquin and Artimesine is inevitable we would support the latter because:

- it is more effective
- it is safer
- it is quicker acting
- it is herbal based
- the technology is being developed at CDRI (though injectable artemesine is already available in the country) A tie up or joint venture with the Chinese who have developed the technology is possible.

8.4 The recommendation to improve drug resistance monitoring is welcome but we suggest that these results must be made available to district health authorities and also to the medical profession in the respective areas.

Adverse drug reaction monitoring of old / newer antimalarials should be undertaken and post marketing surveillance by manufacturers of newer antimalarials should be ensured.

8.5 The stress on quality control in the policy is appreciated and we suggest that licensing of drug production should be done keeping quality in mind and drugs must be purchased from manufacturers who fulfill good manufacturing practices.

8.6 While the policy statement mentions the role of the state authorities to monitor drug availability, we would add that the state authority should move beyond monitoring to ensure availability as well, keeping in mind that : availability of post-expiry date drugs is no availability; and availability of injectable antimalarials without appropriate equipment for administration is also 'not availability'.

8.7 Since therapeutic regimens recommended in present day Medical, Pharmacological and Preventive and Social Medicine text books differ from each other and differ also from NMEP guidelines there is need for NMEP to initiate an active dialogue with professional bodies, medical colleges, and academic bodies to popularise their guidelines and reduce the existing confusion vis a vis treatment schedules; controversies and debates related to new antimalarial drugs such as Mefloquin; use of chloroquin resistance and the use of S/P etc., need to be seriously reviewed with professional bodies and then introduced into policy.

A major effort is required to incorporate these guidelines into medical (undergraduate and postgraduate) training as well as in the courses for nursing, allied health professionals and others. These should also be included in the examination.

Workshops, seminars and training programmes on rational Malaria care must be organised for General Practitioners as well.

8.8 The recommendation on drug packaging and information is fully endorsed and its implementation is eagerly expected specially regarding consumer caution on drugs not to be used during pregnancy - e.g., Primaquin.

8.9 Studies of prescription practices for various diseases, including the National Health Programme diseases with fairly clear therapeutic guidelines have shown that irrational drug prescribing is a major public health problem in absence of unbiased drug information; inadequate continuing medical education; and dependency on medical literature provided by sales representatives of medical companies.

In view of the above, and recognizing, the danger of emergence of drug resistance due to irrational use of drugs especially antibiotics in malaria, there is the need for an urgent antibiotic and anti microbial policy.

8.10 Clear therapeutic guidelines, along with diagnostic flow charts are required for different levels for all the situations.

8.11 Updated detailed drug information about the individual anti malarials specially the newer antimalarials should be made available, keeping the recent findings about adverse drug reactions - drug interactions many of which are not known to prescribing doctors. This should also include comparative drug costs, contra indications, special precautions, and drug resistance patterns. All these must be provided to health authorities and prescribing doctors.

8.12 G6PD deficiency and sicklecell anemia mapping should be done and made available to doctors in the affected region with warnings about antimalarials and other drugs to be avoided.

8.13 Proper prescription audits, medical audits and drug audits must be undertaken periodically and in-house prescription audits be encouraged.

8.14 Adverse Drug Reaction - Monitoring centres are grossly lacking and so is the procedure and reporting system for adverse drug reaction monitoring. These must be developed and must include the monitoring of adverse drug reaction to the antimalarials especially new antimalarials.

8.15 There is a need for standardization of dosage of drugs in the market, with withdrawal of unwanted anti malarial drugs.

8.16 A graded essential drug list for anti malarial drugs has to be drawn up so that certain anti malarial drugs are restricted for certain level of training and competence.

8.17 Information about the anti malarial drugs allowed in the market and those available in the market, production patterns of anti malarials needs to be available (e.g., even though Mefloquin is not a part of NMEP, Mefloquin is available and being used indiscriminately).

8.18 ***Prices of antimalarials*** have increased over the past few years after DPCO 1986 and DPCO 1994. Serious malaria patients cannot often afford the required costs of quinine injections and IV sets. With the increasing shift towards fee for services, at least in endemic areas antimalarials etc., should be available free (as mentioned in Malaria Action Plan 1995) or they should be very, very reasonably priced!

8.19 Action must be taken against those purchasing substandard antimalarial drugs in violation of the tender and those selling government antimalarial drugs in the market.

8.20 Specialised centres for treatment of complicated malaria should be established in teaching hospitals of medical colleges.

8.21 Indigenous drug policy should be established in relation to import and marketing of newer drugs depending upon the background information on drug sensitivity situation in the country.

8.22 NMEP's stand on Amodiaquin and Ayush-64 (Ayurvedic preparations) should be made clear. The latter has been recommended after studies undertaken by the Central Council of Research in Ayurveda and Siddha.

8.23 NMEP should send its guidelines (atleast once a year) on drugs/dosages/precautions and contra indications to Drug Today / CIMS and other similar publications which are routine reference for practitioners.

[for further background on Antimalarials in the country - Production/Pricing/Availability : See Appendix D]

9. THE 'MEFLOQUIN' ISSUE

It is significant that even though the committee to review the National Drug Policy on antimalarials noted that ***Mefloquin*** has certain drawbacks such as

i. No action on gametocytes and hypozoites.

ii. Action on parasite is slower than any other antimalarials.

iii. Its half life is very long therefore resistant strains are selected more quickly than any other antimalarials.

iv. Severe toxic effects especially neurotoxicity and should be carefully used.

v. Not suitable for chemoprophylaxis

vi. Not marketed in the country.

it noted that ***in the light of the demand by the medical fraternity*** it can be used for P.f cases resistant to chloroquin and not-for treatment of P.v cases.

As additional caution it recommended that the Drug Controller may stipulate strict condition for import, sale and use of Mefloquin through a depot system where:

i. Drug is issued by mandatory prescription of a qualified registered medical specialist.

ii. Prescription is accompanied with laboratory report issued by qualified parasitologist indicating that there are P.f rings in the peripheral blood.

9.1 We are deeply concerned about this recommendation / guideline and feel that the *introduction of Mefloquin at this stage is not at all warranted because:*

a) Irrational use and misuse of drugs especially new drugs is a major public health problem in the country. Failure to take action against drug misuse or the absence of a system of prescriptions audit has encouraged the above. Mefloquin was already being smuggled into the country and was available at exorbitant prices. An okay for its import now will only enhance its misuse and overuse.

b) It is a costly drug, based on 100% imports and if misused/overused it will unnecessarily increase the costs of medical care for the patients or the system which provides it e.g., CGHS, ESI, etc.

c) Cross resistance with quinine develops rapidly, so loss of effectivity of quinine due to mefloquin misuse especially when P.f infections are increasing in the country would lead to a major public health catastrophe. Also in the absence of adequate facilities to monitor development of resistant strains we may be inviting problem by this decision.

d) Only oral preparations are available and attempts of administration through naso-gastric tubes in sick patients of cerebral malaria would be very unreliable.

e) Mefloquin is not recommended by the CDC (USA) for standby treatment in any situation. Breastfeeding by mothers taking mefloquin is contraindicated. Teratogenicity in animals has been noted and therefore it should be avoided in the first timester. Alternatively women should avoid being pregnant for 3 months after taking it.. It is contraindicated for those with h/o convulsions and psychiatric

disorders and in patients with severe renal hepatic dysfunction and cardiac conductive disorders. In the Indian clinical situation, none of these cautions or contraindications will be adequately operationalised; hence the increased danger of iatrogenesis.

f) Some strains of P-falciparum are naturally resistant to Mefloquin and because of fears of emergence of general resistance there have been calls to limit its use only to prophylaxis and treatment of chloroquin resistant or multidrug resistant falciparum malaria. Guidelines for management of chloroquin resistant malaria must be communicated and rational implementation ensured.

g) Its introduction at this stage as a new imported drug will require adequate comparative studies, post marketing surveillance and gearing up the drug distribution scheme to follow the said guidelines. The drug control/distribution system in the country is not yet adequately geared for this task.

h) Technically mefloquin has no advantage over other available antimalarials effective for P-falciparum a fact not adequately communicated.

i) As the gametocytes are not killed by Mefloquin, so a patient treated with Mefloquin will remain a reservoir of infection and a public health danger, spreading the infection in the community.

j) In practice in the Indian situation it will not be possible to comply with the condition of 'compulsory laboratory report by qualified parasitologists indicating that there are P-falciparum rings'.

k) It is obvious that the so called 'demand of the medical fraternity' has been based on either inadequate knowledge of all the above factors significant to the Indian situation, or has been engineered through misinformation and or incentives by the private drugs lobby. Neither of which should have been allowed consideration by the Expert group. Drug controllers restriction on Mefloquin are also not widely known to those prescribing, selling or purchasing.

We would therefore suggest that the decision to allow import and use of Mefloquin should be seriously reviewed and all the above factors should be reconsidered as part of the decision to restrict its use..

Taking all these factors into consideration the permission to import Mefloquin will only facilitate unethical medical practice and promote misuse/overuse of a drug that should be kept severely restricted as the only second line against chloroquin resistance.

10. PERSONAL PROTECTION MEASURES

Given the fallibility of vector control measures due to inaccessibility of areas, non-feasibility of covering /tackling all sources of larval breeding or due to lapses in regular execution of such measures, personal protection measures must be known to all the affected population to reduce the chances of mosquito bites and hence of contracting malaria.

Awareness of such measures can be built up in the communities by various techniques. There are others which can be enforced by legislation. Promotion of methods can be carried out to allow the people to select such measures according to their socio-economic status, culture, living habits and liking.

For instance, in urban areas legislations could enforce mosquito proofing of houses in order to be declared "safe for living", or taxation could be removed/minimised for mosquito reprellant creams/ oils etc. Similarly, street theatre, videos or hoardings could be used to promote bed nets.

The promotion of relevant personal protection methods can be variedly stressed for various habitats and socio-economic groups, keeping in mind the limitations of each measure .

Various measures have been listed out in the operations manual for the Malaria Action Plan (Annexure 5, Page 120) which we endorse.

10.1 <u>However, we suggest the following additional action in this context</u> :

A. i. Simple messages like "sun down - sleeves down" or wearing of adequate clothing after dusk to avoid mosquito bites - giving the figures of less malaria in women as a possible proof of the measures efficacy - can be emphasised. This is relevant for both endophagic and exophagic varieties of Anopheles.

ii. Smoke fumigation especially burning of need and /or tulasi leaves of houses before sleeping hour as a partially effective measure to reduce vector density in sleeping rooms must be mentioned for the choice of poor sections of the population.

B. Legislation for Enforcing:

i. all buildings below 2500 msl in urban areas to be mosquito proofed

ii. all nets to be standardised for their weave to 150 holes per square inch or 8 holes per 10 mm linear length

C. The efficacy of bed nets, for fever patients to sleep under as a malaria prevention measure for the family and community needs to be highlighted.

D. Encouragement of Neem and Citronella plantations as an environmental intervention to decrease vector population near human dwellings should be given importance. Citronella oil over the exposed parts of the body also repels mosquitoes.

E. Although the reservations to impregnated coils and pellets on account of lack of studies about the possible harmful effects of chemical vapour of Allethrin have been mentioned, the reservations to Deltamethrin - another synthetic pyrethroid with similar limitations - have not been expressed. In fact a major focus on impregnated bed nets as the preferred measure to stop malaria transmission is revealed from all the recent NMEP guidelines which is not at all commensurate with the obvious limitations that they have in Indian rural conditions (see note on IBN in next section).

11. IMPREGNATED BED NETS - SOME CONCERNS

Bednets as a protection against mosquito bites and malaria have been used for centuries and became more popular after Ross's discovery nearly a century ago. Recently, insecticide impregnated bed nets have become an important method of malaria control in many endemic countries.

In India, NMEP/MRC have recently done studies in Assam, Orissa and Madhya Pradesh and have demonstrated the usefulness of the nets in the control of transmission especially in the first two states. They have also field tested a variety of synthetic pyrethroid insecticides and found them highly useful in the treatment of bed nets @ 25 mg/sq m. However, the success of bed-nets will depend on the biting behaviour of the local vectors and also the cultural habits of the population e.g., in Madhya Pradesh - in villages where the local Gond tribals slept in fields, or went collecting Mahua, tendu leaves or fishing at night, the IBNs were not effective.

In Assam, the government has accepted the programme and many industries are also providing them to their employees.

11.1 ***While welcoming IBNs as a useful technology in malaria control we are concerned with certain recent trends.***

IBNs are being promoted in International Public Health circles as one of the magic bullets in Malaria control and many programmes in many parts of the world are becoming unipurpose bed net distribution programmes supported by commercial interests. International consultants promote it indiscriminately and funding agencies tie up grants and loans to their use. This is an unfortunate trend.

We believe that IBNs do have a role. They have been recommended by the Task Force (1993) "Methods like personal protection by IBNs, curtains etc., at places where feeding and resting behaviour of vectors would permit a successful intervention of malaria transmission, should be advocated";

The NMEPs document to the World Bank also mentions it but cautions that "based on vector behaviour and related studies we have stratified the country, where bed net programmes will produce impact on transmission... in all other areas the bed net programme is unlikely to produce any significant reduction in malaria transmission".

11.2 We therefore suggest that

- *IBNs should be promoted as part of a multi-alternative programme and a multipronged strategy and not as the only option programme in any initiative, governmental or non-governmental.*
- *Studies should be done on their acceptability, feasibility and sustainability keeping particularly focus on the poorer sections of the community.*
- *They should be community based and community controlled and not topdown, subsidised or free distributions through the programme. (One of the dangers of a top-down programme are that large percentage of already meager funds could get utilised in purchase of massive amounts of IBNs with potential for commercial deals and SCAMS that are not uncommon in India today, and then get sold in the market as well!).*
- *Deltramethrine's long term effects on pregnant women and children are*

not adequately studied as yet. So also other insecticides that can be used for impregnation.

- *It must be remembered that a large majority of the population do not even have proper beds; are too poor to invest in nets; and overcrowding is not an uncommon problem. While family bed nets and impregnated curtains etc., may be appropriate alternatives - too much focus on 'impregnation' may divert attention from other methods/strategies. To began with IEC could promote plain mosquito nets for the time being and especially for one month from the day of fever for any patient.*

- *[During the Rajasthan epidemic 90% of the deaths took place in SC, STs and Muslims though their population was about 40% and they told the health team that they would never be able to procure nets for all the family members. This way one or two may be enough!] In Assam, it was also STs and Muslims.*

- *Bilateral funded projects and agencies that provide loan should not make the use of IBNs conditional and the NMEP should actively prevent this method from becoming aggressively promoted as the new magic bullet in International Public Health collaborative support to the programme. The guidelines in Annex 5 of MAP and NMEP's own stratification of the country vis a vis IBN use need to be kept in mind and the findings of the continuing operational research on its use in governmental and non-governmental must be shared widely to prevent 'market forces' from overpromoting it.*

- *<u>It is important to distinguish between promotion of impregnated materials (bed-nets/curtains) through public education, and their application as an intervention for malaria control</u>, aiming at a certain level of coverage of a given population and funded fully or partially by public funds. In the latter use, it is important that their efficacy under local conditions has been documented and that sustainability can be ensured.*

- *Finally, while IBN may be a new tool promotion of ordinary bed nets and efforts to popularise them should be resumed. These have lessened ever since the introduction and marketing of coils and pellets.*

- *If the above 'caution' and 'concept' are kept in mind IBN's should definitely be welcomed as an option for which more action / operational research should be promoted.*

ITN - CAUTION !

Insecticide-treated nets (ITN's) have emerged in recent years as a promising tool to stem the rising tide of malaria in the world. ..... <u>However the cost, effectiveness, long term sustainability, and practical feasibility of routine ("non-research") ITN implementation programmes are not yet well documented</u>. The considerable impact measured in highly controlled trials has partly obscured the fact that ITN programmes are both complex and costly. <u>They will not be easy to implement and sustain on a large scale in routine health intervention programming</u>. Therefore, to better inform programme managers on the "how to" of this intervention, more operational experience is needed. Novel approaches to the financing, distribution, periodic reimpregnation, and promotion of ITNs need to be explored.

- Executive Summary ... Net Gain - IDRC/WHO (1996)

Case Study : Action 1

Evolving a community based malaria control strategy including IBNs

Bissamcuttack, Orissa, 1996

[The Christian Mission hospital in Bissamcuttack , Orissa has been recently involved with tackling the malaria problem by involving the community from the villages served by the hospital as follows :]

Step One

- We began with helping people to recognise their public health enemy No.1 - ***Malaria*** by sharing with them the MIS data from the government PHC on Morbidity and mortality. This prepared the ground for step two.
- We also did an informal survey to ascertain sleep habits and patterns, according to community, age and gender.

Step Two

- If the village so desired they invited us to explain to them the basics of Malaria. This involved almost a full day when we met with as many of them as could get organised into groups according to gender, age and community. The classes were quite intensive and based on 4 questions:
    1. What is Malaria?
    2. How does one get it?
    3. What can we do if we get it?
    4. What can we do to keep from getting it?
- We used teaching aids flashcards (ODA-Care), photographs, Neem oil, mosquito nets, Deltamethrin, etc.
- An Oriya pamphlet was also distributed to those who could read.
- We stressed environmental methods, neem oil, clothing and nets - as alternatives.

Step Three

- The villages chose the options they wished to pursue. Most opted for Neem oil and impregnated nets.
- The village decided who will take charge - usually 2 or 3 respected people. They would be incharge of finalising the order, supervising the distribution and collection of money. Each village decided on different schedules and modes of payment.
- We supplied nets, taught the method of impregnation and taught 8 principles of using the net. Our team members stayed over the first night to help sort out 'teething problems'.
- We got nets from Raipur and Deltamethrin from Calcutta.
- More than 50% of our investment has been repaid already.
- Our investment had been in terms of time, energy and capital money. The approach chosen was slow but encouraging.
- We have not raised the question of subsidy because most families spend around Rs. 800-00 a year on Malaria and our nets are cheaper than local shops-so they opt for it.

To summarise:

Our strategy is an Alternative, people based, village level, sustainable strategy with 3 basic thrusts:

a) Malaria Education
b) Promotion of personal protection measures - all methods including IBNs
c) Early clinical diagnosis and prompt treatment.

We then did a 2 day workshop for other NGOs to share our experience. The idea is that they will go home and launch similar village level 'wars' against malaria!

-Christian Hospital, Bissamcuttack, Orissa.

12. VECTOR CONTROL IN MALARIA CONTROL STRATEGY

The principal objective of Vector Control has been reduction of malaria incidence by reducing the level of transmission. Whereas 'early detection and prompt treatment' prevents mortality, the adequate intervention measures for transmission could reduce quantum of morbidity in the community. It is therefore essential to choose proper control measures to reduce/interrupt transmission. The type of control measures to be used locally will depend on vector species, its behaviour, environmental and other socio-economic factors related to the community.

12.1 Reliance in vector control is now being shifted from total dependence on insecticides to ***integrated vector control*** adapted to local situations. This would involve the application of biological and environmental management methods along with the insecticides. Under the NMEP it is proposed to phase out insecticides in due course and limit their application in special situation e.g., epidemic control, disturbed areas and in areas where alternatives to insecticides are either not available or unlikely to succeed.

12.2 While the Vector Control Policy of NMEP has been subject to constant review and adaptation to suit the needs of the programme, ***we would like to highlight and endorse some issues of concern*** :

1. ***Development of insecticide resistance among vectors of malaria***. The problem of insecticide resistance is mainly affecting the control of A.culicifacies, the major vector of rural and peri-urban Malaria in India. This is being studied by NMEP/ MRC but the findings are not adequately disseminated; so even in resistant areas spraying is continued as a ritual.

2. ***Environmental pollution due to use of insecticides for vector control is an increasing hazard***. Use of chemicals in vector control cause harmful effects on beneficial fauna, and food chain contamination. The environmental lobby has managed to convince the government to phase out insecticides by 1999. What next? Are we adequately planning for that phase?

3. ***There is a lack of adequate infrastructure and studies about the relevant environmental, ecological, social, economic and health service facilities for selective vector control in different areas***. This needs to be addressed urgently.

4. ***There is a lack of effective inter-sectoral coordination*** with different department and development projects,(irrigation, agriculture, flood control, public works, water supply and drainage system in urban areas etc.,) for reduction in vector breeding. Much of the resources of the programme will be wasted if this coordination is not enhanced actively.

5. ***There is a lack of adequate entomological expertise*** required for the decision whether or not to use spraying in a particular area, which insecticide should be used and when spray operation should be done. This is particularly crucial when the decisions have to become more local / focal.

6. ***There is a lack of adequate trained qualified staff for sound technical management***. These include epidemiologists, entomologists, public health/malaria engineers, etc., at Regional, State, Zonal and District levels. In the state of Karnataka with a fairly high level of health care 4 entomologists are presently

available out of 25 sanctioned posts!

7. ***There is a lack of studies*** on quality and coverage of spray operations and trends in malarial disease. Where studies are done, information is not adequately disseminated to inform policy decision.

8. ***Upto now plans for spraying have been based on a single uniform criterion viz., a certain annual parasite incidence (API)***. This is unacceptable, since such criteria do not reflect the disease problem and do not take into account the other epidemiological and social factors that affect the efficacy and sustainability of the spraying programme.

9. ***Irregular treatment of the breeding places and lack of inspection at frequent intervals*** is responsible for failure of impact of chemical or biological larvicides in urban and peri urban areas. In fact, it would not be unfair to state that in most urban areas this necessary component of the programme is mostly non existent due to reasons beyond NMEP's jurisdiction and reflective of the serious crisis of urban development. In urban areas vector control is the responsibility of local bodies like Municipalities and Corporations and they usually plead lack of resources for doing a poor job. There are a large number of vacant posts in the Urban Malaria Scheme. The recent landmark judgment (Kerala High Court) highlights this issue with regard to local bodies and vector control.

10. ***In urban areas vector control is the responsibility of local bodies*** like municipalities and corporations {under the Urban Malaria Scheme (UMS) }; they usually plead lack of resources for doing a poor job. In many towns and cities posts in the UMS remain vacant. The recent landmark judgment by the Kerala High Court highlights this issue with regard to local bodies and vector control.

11. ***There is a lack of management information system and decentralization of decision making*** to determine the nature and extent of selective preventive actions. This will need to be addressed urgently by NMEP in the years ahead.

12.3 We suggest the following

- *Selective application should be the guiding principle in the development of rational vector control strategy because of the imminent technical problems in continuous use of insecticides in vector control. Selective application technique requires a proper mix of other vector control strategies viz., engineering methods, biological control, legislative measures, minimum use of insecticides like spraying to tackle epidemic situation, spraying in houses and not cattlesheds, spraying only during the ascending phase of vectors with the possibility of transmission and correct selection and timely application of insecticides which would produce cost-effective results. Spraying should also take into consideration the target species, particularly the sibling species found in the areas. In general, spray should be targeted against the susceptible and endophilic vector population and field operations should be economically viable and sustainable.*

- *For effective control of transmission there is need for timely spray operations during the ascending phase of vectors, with suitable insecticides, covering the entire targeted population. For this timely supply of appropriate insecticides to the States is essential.*

- *The States and local administration should accord priority to proper water disposal and sanitation. Model by-laws should be enacted and implemented to eliminate mosquito breeding places under Urban Malaria Scheme. This is urgent.*

- *Inter-sectoral coordination and multi-disciplinary approach are needed to reduce the mosquitogenic conditions. Large scale environmental management, as part of land reclamation, agriculture programmes, municipal sanitation, industrial projects or public works in general require specialised teams of staff. Environmental and entomological factors should be carefully assessed before specific control measures are planned for a particular situation. Capacity for such assessment must be built up.*

- *It is essential that residual insecticidal spray should be planned and implemented with sound technical skills and under expert guidance. It should not be entrusted to non technical personnel like contractors, etc. While the voluntary sector may not usually have the expertise to take on vector-control measures - the government could consider involving them in areas where they have both capacity and competence or are willing to get involved in building up such capacity and competence. In many parts of the country, where the government health infrastructure is very poor - this may be an alternative to be considered especially if the voluntary sector has a significant presence.*

- *Use of larvivorous fish (Guppy, Gambusia, Killi fishes etc.) should be undertaken where breeding places are well known and restricted in size. MRC's recent studies on field application of this method must inform such policy. There are veterans of the pre DDT era still around who may be able to help NMEP start an effective programme and not 'reinvent the wheel'.*

- *Bio-environmental control of malaria as a long term measure should be planned. This can be achieved as a multi-disciplinary programme activities including active involvement of the community. The work of VCRC and MRC in this area should be disseminated and thus privatisation must be avoided to prevent market economy factors from affecting costs/strategies.*

- *Training of operational staff at district level. The malaria control staff at the district level should be properly trained for proper implementation of the above mentioned operation seriously supported by action/and operation .*

- *An important area of intersectoral collaboration is the link with the water supply/sanitation programmes particularly focusing on drainage of water.*

Hand pumps have been very successful but very often they also lead to pools of water in the centre of the village adding to the malariogenic potential. Those who service and maintain the programme must be aware of the links to malaria especially when surface drainage is not ensured.

- *Local bodies in urban areas should be held accountable for lapses in the UMS, and wherever necessary, state governments should supplement the resources of the local bodies for effective vector control. Citizens groups could use PIL to stimulate more effective responses from local bodies.*

SECTION - C

MALARIA AND PRIMARY HEALTH CARE

13. MALARIA AND PRIMARY HEALTH CARE

It is increasingly recognised that whereas in the past years, Malaria Control was organised as a military operation with clear lines of control, guidelines for roles and responsibilities at every level and the strategy was top down, vertical and unipurpose; and that this approach also resulted in a spectacular reduction in the problem; this approach is not easily sustainable especially when the level of the problem becomes reduced and the problem becomes one of many community experienced problems to be tackled by the public health system in the country. The horizontal integration of Malaria Control with the Primary Health Care centres and the primary health care approach is therefore not just a necessity but becomes crucial to the sustainability of the programme and to its continued efficacy in the long run.

13.1 Malaria control has been integrated with PHC before India's commitment to the Alma Ata declaration but even more so after it. The multipurpose health worker, the lab technician and the health supervisors under the leadership of the MO became the crucial operational team of the programme within the PHC organisation and Malaria Control has been for quite some time one of the many functions of the PHC. The Primary Health Care approach however is not just `public health'; and 'preventive and curative medicine' being provided by government and /or non-government centres in the community, but is more. It is the active mobilization, involvement and participation of the community in the planning, implementation and monitoring of the health programme. That is the crucial challenge and malaria control becomes part of a Primary Health Care strategy only when the principles of (i) Community participation (ii) Appropriate technology (iii) Intersectoral coordination (iv) social equity - become central to the strategy of the control programme.

13.2 In more recent years the Malaria control strategy in the country has become gradually more Primary Health Care oriented and efforts are being made to ensure that the control options and alternatives are in the context of this approach. However, to ensure that this linkage does not become rhetorical but gets operationalised into a strategy, where the involvement of the community in building up the first line of Health care in Malaria control in the periphery becomes a reality, we make the following suggestions:

1. The `Community' in the urban slum, the rural or tribal area must first be, accepted at all levels of the control strategy as 'active participants' of the programme and not 'passive beneficiaries'.

2. The community and/or its representatives both formal and informal leaders, should be involved in the planning and organisation of the activities at all stages of the programme. A village health committee will operationalise this further.

3. The focus of the activities/strategies should not just be on providing the community, a package of services but actively enabling/empowering them to participate in decision making that helps them to make health their own responsibility.

4. The large number of human resources that are available in any community must be identified and mobilised to participate in the programme - this means not only just people - but traditional birth attendants and folk health practitioners; leaders of the panchayat; mahila mandals; youth groups; farmers clubs, school teachers, opinion leaders, general practitioners and practitioners of other systems, of medicine and so on.

5. When required or whenever feasible, volunteers from the community should be trained as village level health guides or link workers to ensure that grass-roots level activity is made possible.

6. The Primary Health Care approach is a comprehensive approach and therefore Malaria control programes should not become unipurpose or selective in their orientation and whether it is the village committee, the health guide, or the strategy, there should be scope and openness to use the same structures and resources for other disease and health problems in the country.

7. A major thrust of such a primary health care oriented programme will be the approach of demystifying the problem at the community level, to build confidence and perspective to tackle it at that level itself so that the health team works in close partnership with the people and the programme becomes identified by the people as their programme.

8. ***The Primary Health Care approach also calls for a certain humility in the health team about not always wanting to `teach' or tell the people something but also a willingness to learn from local experience, wisdom and health culture. The people, when provided the right forum and context will often share ideas, options, alternatives that the health teams should consider and new approaches or alternatives can emerge if this learning from the people and working `with them' rather than `for them' becomes a team commitment***.

Finally we believe that the Primary Health Care approach gets translated into alternatives for action in strategies such as involvement of voluntary agencies and GPs;, training of village guides and link workers; health education and awareness building activity; involvement of village leadership and panchayatraj institution; involvement of alternative systems of health and their practitioners, and so on. All these have been further explored in subsequent chapters.

14. COMMUNITY CAPACITY BUILDING

Empowerment of the community is essential if malaria is to be effectively controlled.

To facilitate empowerment the community should be encouraged to participate in making decisions relating to malaria at the community level. They should be encouraged to decide on the needs for diagnostic and treatment facilities, referral pattern for cerebral malaria and vector control.

They could be asked to suggest innovative ideas in controlling malaria based on their local experiences.

To achieve both the above they must have access to accurate information. These relate to the number and type of malaria cases, deaths due to malaria, the drug availability, type of vector and the pattern of insecticide spraying needed and schedule of spraying.

Such an empowered community must also help in enhancing the accountability for the resources used and activities carried out.

To facilitate community capacity building the following activities are necessary:

14.1 Providing complete knowledge on malaria, its cause, spread, treatment and prevention. This forms the basis of community participation and action.

14.2 Stressing the importance of early diagnosis and treatment. The community needs to be aware of the early signs and symptoms of malaria especially that of the early warning signs and onset of cerebral malaria.

14.3 Providing easily accessible treatment centres including knowledge of proven locally available herbal treatments.

14.4 The community should be made aware of the various development projects, their impact on the environment and malaria and ways the impact on malaria can be reduced.

14.5 The community should be encouraged to identify and select a volunteer who can be trained on behalf of the community in appropriate areas of malaria as identified as the role of such volunteers. This person could be on a purely honorary or voluntary capacity without any payments or paid a regular honorarium by the community/panchayat based on its ability or may be paid on a fee for service basis as accepted by the community. In general the `no pay' model is the best, the work being done with a service motive. The community may recognise such a person in any non monetary way as acceptable.

14.6 <u>Link workers</u>

The possibility of developing a totally different category of a person may also be considered in some settings. This person may be from the community being served or from outside. This worker may have a larger area and may visit a village only periodically on a regular basis. This person may be trained in collecting blood and in exceptional circumstances where microscope is available may even read slides and provide treatment either based on presumptive diagnosis or confirmed diagnosis according to pre determined guidelines. (See Appendix F for further details).

14.7 <u>Community Audit</u>

This concept is gaining acceptance in the Government. Ultimately the community should be able to assess the state and extent of the malaria problem in its area, document the work carried out by the Government or NGO and the improvements or changes resulting from such an intervention. To play this role, the community needs appropriate training.

Case Study : Action 2

Tackling Malaria in Rural Gujarat (Jhagadia, 1995)

[SEWA - Rural is a voluntary agency that has provided health and development services extending from the nucleus of a small rural hospital in Jhagadia. This case study highlights the key features of the experience with malaria control.]

- As an NGO we had taken over a PHC and done mainly surveillance and presumptive/radical treatment of fever just as any other PHC is supposed to do.
- After four years we realised we were getting nowhere and malaria prevalence was changing inspite of our efforts; so we decided to look at feasibility and efficacy of introducing simple vector control measures.
- We took a study and control population and monitored fever cases (smears) round the year and vector density (standard procedures) fortnightly.
- Interventions included simple engineering measures, fish, kerosene and very rarely insecticide (for one-time use to curb exceptionally heavy breeding sites).
- Interventions and Monitoring were done by Male Multipurpose workers and supervisor after due training and alongside routine `PHC work'. The female health workers took on some extra load (of other work) from the male workers.
- We also took the community's help, especially school children, informally.
- Ongoing informal health education was given to people about mosquitoes and malaria.

Result:

- Vector density never rose above critical in study area but almost always remained far above critical in control area.
- General confidence of health workers in other vector control measures rose.
- People became more aware.
- No adverse effects on excellent performance in other health fields (MCH-FP activities).

Next Step

Encouraged by vector control feasibility/efficacy, we are now introducing on condition of community/panchayat participation, a mosquito control campaign in the area!

SEWA -Rural, Gujarat.

15. HEALTH EDUCATION IN MALARIA CONTROL

Creating awareness and building up a knowledge base amongst communities are the commonly accepted forerunners to the involvement of communities and building up their capabilities to act collectively and individually towards a common goal. Although the need for the same clearly comes out of all the NMEP documents and manuals, the commitment to this activity is not adequately visible in terms of the time, manpower, efforts or budgets earmarked for the same.

Since more than eighty percent of the malaria budget accounts for the salaries of personnel involved, and most of the rest gets spent on drugs and insecticides, no more than lip service is being paid to the role of malaria specific health education.

15.1 <u>It is suggested that</u>:

- *There must a quantum jump on the manpower, effort, time, resources and budgets allocation for this purpose. The methods of IEC to be used for target groups for various issues of malaria awareness can be seen in Appendix G .*

- *The most vulnerable and high risk groups for the present P.falciparum epidemic are usually illiterate and have no access to radio or television. In view of this, socially relevant and low cost alternatives addressing these particular target groups should be used. Folk artists, itinerant performers and street theatre artists can be used to pass correct and specific messages to entertainment - starved rural communities. These artists can be employed under various employment guarantee schemes or tribal development plans.*

- *Campaign mode of door to door and village to village malaria education in the pre-malaria season - (instead of observing such a week for the entire country in May, North East could have it in February, and some in May, depending on the onset of rains in the area) - by the health providers working closely in that particular community, stressing the symptoms of malaria, of its complications and that the treatment for the same exists with them should be done.*

- *Posters and videos do have their role but cannot be allowed to overshadow the forms of communication mentioned above because of the irrelevance to the most vulnerable and deserving section of the community.*

- *Teachers and school children need to be specifically targeted for malaria specific health education as the long term effects on their action potential are the most beneficial and effective.*

- *Paucity of funds cannot be cited as reason for a lack of emphasis on the above and innovative methods .*

- *NMEP and MRC have in recent years produced many useful booklets/ pamphlets, videos and other useful health education materials. These are however used only within the NMEP system. There is urgent need to make them available freely on a much more open basis to all groups outside the government system who wish to be involved in awareness building.*

- *Communication centres within the Voluntary agencies may be encouraged to use these materials, adapt them to local/regional needs, translate them into the local vernacular and work on alternative approaches to communicate the key messages and facts in other interactive, low cost ways. Their own expertise in alternate forms of communication could be tapped by NMEP/MRC as well.*

Case Study - Action 3

Health Education for Malaria

(An experience in Rural Gujarat)

[The Trust for Reaching the Unreached (TRU) is a voluntary agency involved with health and development services for marginalised rural communities in the Panchamahal areas and the bastis of Gotri area in Vadodara City.]

When TRU started its work in the Shivrajpur area of Panchmahals, 70% of our OPDs in July to October were cases of Malaria. Patients would pour in from interior villages walking, on bicycles, or being carried on shoulders or in a doly. For the first two years, we responded to this by a clinic based approach.

In 1992 we decided to train our health workers for intensive health education work in malaria. The training covered all aspects of clinical diagnosis, treatment and prevention. By 1993, their clinical skill to treat and diagnose Malaria was adequate.

Since July 1993, our programme consisted of intensive door to door education on `how to recognise the early symptoms' and how to treat it effectively. The emphasis was on taking 10 tabs of chloroquin, continued intake of food and not going to private practitioners for injection or for IV fluids. A few leaflets were given out as aids to health workers for person to person health education. Public programmes including role plays on malaria and a folk dance on malaria were added during the period.

School children between 8-15 years were taught elaborately about malaria including rational therapeutics. The children were our real messengers. They had a weekly class in health and produced posters during the health camps. The school programme went on in 10 schools in the area.

Results

1. While it is too early to claim a reduction in the OPD cases, people in general are more aware, report fever earlier, and do not accept the private practitioners' arguments for injections.

2. During the Malaria season, all the surrounding areas showed increased incidence of malaria but the villages around Shivrajpur were happy with full chloroquin course.

- Trust for Reaching the Unreached, Baroda, Gujarat.

16. ROLE OF THE VOLUNTARY AGENCIES IN MALARIA CONTROL

The role of NGOs especially the voluntary agencies (not for profit NGO's) is being increasingly recognised in planning and policy circles as an effective complementary / supplementary strategy.

In the past, they have played this role without much governmental support. In more recent years a greater degree of collaborative effort is emerging as a policy alternative.

16.1 The Voluntary agencies (Volags) have their Strengths

a) They are closer to the people and usually more aware of grass root realities

b) They often work in more interior and inaccessible areas or in accessible areas with more marginalised groups and the underprivileged.

c) They tend to be idealistic and committed to certain values and principles.

d) They are more flexible in their organisational structure and their professional approaches.

e) They often have a stronger development orientation and awareness building commitment and skill.

16.2 The Voluntary agencies (Volags) have their Weaknesses as well

a) They are very dispersed and individualistic and not woven into any integrated network.

b) They are often aloof from governmental programmes having their own programmes and agenda.

c) They are very diverse in their size, type, ideology, focus, distribution, linkages and professional competence.

d) They are inadequately informed about governmental programmes and initiatives and often lack adequate professional expertise being stronger in spirit rather than in skills.

e) They often follow fund driven/donor driven agendas.

f) They are also not often present in areas where they are needed most.

Notwithstanding these shortcomings, it is a very important development that the opportunities of government - non governmental collaboration are being increasingly promoted in recent years though involvement in malaria care is still not significant.

16.3 Concerns

a) As a group, we were concerned that inspite of well organised network of voluntary agencies and an increasing commitment of this constantly enlarging sector, to alternative service provisions, alternative training strategies and alternative research approaches and health communications and awareness building strategies, the actual collaborative possibilities between the two sector has been so inadequately

mobilised.

b) Inspite of competent coordinating agencies at National and now at state and regional levels this involvement and collaboration has been a policy thrust but not a policy reality.

c) The government or the programme authorities still try to look at the Voluntary agencies as primarily alternative service providers and often disregard their skills in research, training, communication and mobilization.

d) The large, rich network of Voluntary sector health communication efforts including journals, bulletin, newsletters have not been adequately harnessed to spread the key messages and strategies of Malaria Control and thereby enhance the involvement of this sector.

16.4 The Voluntary agencies can play the following roles in Malaria Control:

a) Diagnosis

Volags with health programme and having a laboratory facility can contribute to lab diagnosis. When reliable centres are identified the reports of such centres may be used for treatment and surveillance.

Volags who do not have a laboratory technician may have one or two trained as smear technician on collecting blood samples correctly and where personnel with capability and microscope is available some may be trained as microscopists to identify malaria parasites.

b) Treatment of Cases

Volags with or without a health programme can facilitate treatment both in presumptive and confirmed cases and in radical treatment. However, clear guidelines must be given to Volags and appropriate training must be provided to atleast two or three personnel from each Volag.

c) IEC

It is probably better to change this terminology from IEC to Education for Health. IEC appears more to be passive transfer of information. Education for Health requires certain additional steps to bring about individual and community action - going beyond information transfer. If clearly acceptable and accurate messages are made available to Volags many of them can motivate the community to accept or adopt changes in lifestyles or behaviour that is more health oriented.

d) Vector Control

While volag personnel and volunteers cannot carry out vector control measures according to present policies volag can participate in the following measures.

- Volags can take up anti-larval measures including keeping surroundings clean (without long term accumulation of water) and use of larvicides.
- Volags can promote bio environmental measures such as use of larvicidal fishes.
- Educating farmers on methods that present growth of mosquito larvae.

- Motivate people to accept anti-vector spraying when done by trained personnel and to allow proper spraying of indoors with adequate precautions.

- Work in coordination with the NMEP spraying teams in facilitating effective spraying as it differs from place to place and habits of the vector.

[It may be appropriate to simplify technology and provide entomological information so that in areas where there are limited Government personnel, Volags can do the spraying after adequate training]

16.5 Suggestions

To operationalise a healthy collaboration between NMEP and Volags the following steps should be initiated as soon as possible.

- *The Central and State governments should involve the Volags in the planning, implementation and evaluation of the Malaria Control Programme. They should not be treated as mere adhoc agencies to be used during epidemics, when government set up has failed to achieve the desired results.*

- *Malaria Advisory Boards/Committees should be constituted at the National/State and District levels with adequate representation of Volags. The entire Malaria Policy and Strategies for control need to be looked into and implementation reviewed at regular periodical intervals.*

- *Health Education should be an important component for effective delivery of Malaria Control Programme. The conventional manner of conducting health education would not be suitable particularly in the tribal areas. Health education should be based on socio-economic and behavioural attitudes of the local community.*

- *Volags have close liaison with the local people. Essentially, malaria is a disease of human behaviour. The human behaviour has to be changed against malaria transmission. This ranges from source reduction, timely seeking of medical advice and undertaking self protection measures. Health education with appropriate messages would be of considerable value and Volags effort would be particularly suitable in this area.*

- *The groups working in the field of health and development should be given training in (i) Surveillance of fever cases and reporting of unusual occurrence of fever cases to the local health authority for prevention and management of outbreaks, (ii) diagnostic skills - clinical and microscopic diagnosis of malaria (iii) rational treatment-presumptive as well as radical (iv) health education and public awareness (v) integrated mosquito vector control.*

- *Volags should be actively involved in public awareness campaigns before the start of malaria transmission periods.*

- *The pattern of involvement of Volags in the NMEP should be on the pattern of National AIDS Control Programme where certain percentage of the budget is earmarked for implementation of the programme through Volags and private sector. The technical capabilities of these new partner groups should be developed through suitable trainings so that they can play an effective role.*

- *All these efforts could be coordinated at National and State and even regional levels by utilising and promoting the involvement of the coordinating/networking agencies of the Voluntary agencies like VHAI (Voluntary Health Association of India), CMAI (Christian Medical Association of India), CHAI (The Catholic Health Association of India), MFC (Medico Friend Circle) and their state and regional units rather than dealing with specific individual Volags in an adhoc fashion. These networking agencies can enhance collective action which is crucial for the programme.*

- *In the context of `Malaria Programme' since there is such a diversity of complementary activities that could become part of Volag initiatives it is necessary to ensure that the contact/ coordination/involvement is not confined only to the `Health oriented' projects/organisations of this sector but also the larger components of developmental organisations, environmental groups, womens organisations, trade unions and communication/media groups. Each component of this sector could identify its special supportive/ complementary role. (See Appendix I for further details).*

17. CAPACITY BUILDING OF VOLUNTARY AGENCIES

Flexibility availability and facilitating community participation have been some of the acknowledged strengths of Volags, that have made them useful partners in intervention and development programmes. If the capacity of Volags are developed in the area of malaria control then they can be effective partners in keeping this disease under control. The following are some of the areas of capacity building:

1. **Developing Volag Resource Centres**

   Since many Volags operate in isolated areas selected Volags with commitment to the malaria control programme may be identified and developed as resource centres. Roughly it may be one Volags Resource Centre for each district. These centres will have trained human resources, (malariologist, smear technician, microscopists, health educator, diagnostic equipment, treatment facilities and training infrastructure to train other personnel primarily of Volags and where necessary and feasible of Government personnel also. Existing laboratories in Volag Centres may also be strengthened. Diagnostic materials and drugs may be provided by the Government to such Volag Resource Centres.

2. **Capacity Building for Enhancing Community Awareness, Action and Involvement**

   Volags may be provided with correct messages on malaria to be passed on to the community. In addition they may be provided educational and IEC materials for community education. They are usually adept at enhancing community participation and action. Where these skills/orientation are required the large network of community health trainers who are experts in this may be tapped to facilitate these skills among field based Volags.

a) Personal Protection Measures

   Volags may be provided with complete information relating to personal protection so that they can incorporate these as part of the intervention strategies in the community.

b) Vector Control

   While spraying is primarily a task of the NMEP personnel in selected regions, for some areas it may be useful to build the capacity of Volags to carry out spraying insecticides according to guidelines and criteria procedures laid down by the Government. In addition they may be trained fully on biological methods of vector control including anti larval measures.

   However, in most situations Volags should be trained that they have access to the Government spray team according to defined needs.

c) Volag Cell at NMEP

   Since according to the present malaria control policy there are definite roles defined for Government personnel and Volag personnel it would be useful if there is a Volag Cell at NMEP both in Delhi and at the State Headquarters. Having such a cell would facilitate better interaction with Volags and give them a forum or channel within the Government through which they can work better in malaria control. This NGO cell should work in close coordinator with National networking

agencies of the voluntary health sector like VHAI, CHAI, CMAI and their regional and or State level units. (See 16.5)

d) Funding for Volag Capacity Building

At the grassroot and the community based intervention level training costs may be incorporated into the regular NMEP budget and even state health budgets for training. Select Volag personnel from Resource Centres may have funds provided through bilateral and international funding available to the Government. This could be for both select short term training programmes as well as for participating in workshops, meetings and other opportunities for south-south and south-north dialogue.

Case Study : Action 4

Preventing Malaria in a Rajasthan Taluka - Lunkaransar, 1995

[The Uttari Rajasthan Milk Union Limited (URMUL) Trust is a farmers cooperative that organises an integrated rural development programme with health care being an important component of the diverse development package. They were actively involved during the malaria epidemics in their area of operation in recent years and tried to evolve strategies to keep their villages free of malaria deaths.]

Aim to keep our villages free of deaths from Malaria .

Our limitations

1. One lab technician for our 30000 population scattered over 2500 kms. and also doubling as Health Coordinator.
2. 3 PHCs and 1 CHC as referral support and numerous RMPs and quacks - none of them under our control.
3. No data for 1994 but government data put API below 2 everywhere so no spraying could be done.
4. Literacy levels of women <5% and males below 20%.

Our Strategy

a) Drug Distribution Centres with teachers who were trained for the purpose.

b) Chloroquin taken from government and replacement made every month.

c) Modified Fever Treatment Depots with our own workers.

d) Presenting our findings on fortnightly basis to CHC, CM & HO, Dy. CM & HO- Malaria, District Collector and Divisional Commissioner to galvanise action on behalf of district authorities.

e) Posters procured from government and pasted all over.

f) Pamphlets in Hindi for all educated people and RMPs and quacks.

g) Street theatre and puppet shows by our communication team in each village.

h) Placing slides with RMPs etc., to help in monitor patients.

i) Introduced larvivorous fishes in own campus to help staff gain confidence in method and effect.

j) Holding and referral facilities for the serious at our headquarters centre.

Results: Succeeded in our pledge to prevent malaria deaths.

- URMUL TRUST, Rajasthan.

18. ROLE OF PRIVATE PRACTITIONERS IN MALARIA CONTROL

The National estimates of the percentage of health care provided by private practitioners in rural and urban areas vary greatly from different source but overall estimates conclude that nearly 2/3rds of the health care provided to the people are by this sector. Private practitioners include those trained in medical colleges in the allopathic tradition (MBBS), those registered as medical practitioners (the RMPs) from different backgrounds, and those trained formally and informally in other systems of medicine which include seven alternatives in the Indian context - Ayurveda, Siddha, Unani, Naturopathy, Homeopathy, Yoga, Tibetan Medicine. They are most often the providers of first contact care especially when home remedies and folk health practices have not been effective. The total guestimates range between 4-5 lakh practitioners who would fall into this category atleast (probably an under estimate!). In the context of Malaria - they are the first group to be consulted at the onset of the febrile episodes and their involvement in Malaria control becomes crucial. It is surprising however that NMEP has not had adequate clarity and policy focus on the involvement of this sector in an active way.

18.1 Issues of concerns

It is a matter of great concern that in the absence of a planned dissemination of relevant information and update on rational malaria diagnosis and treatment including rational regimes utilising the generics/specifics available in the Indian market, the role of the Private practitioner community in malaria control is rather dubious and marked by increasing commercialization and unethical prescribing trends.

Some aspects of this trend are:

1. a use of a wider diversity of irrational regimes and combinations often at high cost to the patient and totally at variance with the NMEP guidelines

2. a tendency to exploit the illness episodes by the use of injectable preparations and other adjuncts not in consonance with the principles of rational malaria care.

3. a tendency to see the `outbreak' or `epidemic' as an opportunity for gain rather than as an opportunity to be actively involved in a national health programme and national efforts to tackle a major public health programme.

4. These trends are further complicated by an increasing fall in clinical diagnostic standards and inadequate recourse to lab diagnostic facilities. The clinical laboratories also have been showing a lack of quality and standardization even when they are available and utilized.

5. Further some degree of medical misinformation by medical representatives pushing their company's remedy against the other to enhance profit margins even when low-cost generics are available is a growing problem.

6. The obvious result of such continued, irrational medical practice is reflected in the increasing problem of drug resistance, as well as the continuation of unnecessary and avoidable suffering.

18.2 SUGGESTIONS FOR ACTION

- *The GPs, RMP, other unregistered practitioners are to be considered part of the Malaria Control Programmes and therefore to be educated about the aims, objectives and functioning of the NMEP and to be oriented accordingly.*
- *They should be made to feel their responsibility towards country's malaria control and the people.*
- *CME programmes should be organised involving IMAs, medical Colleges and other professional organisations using uniform "Module" with minor regional variations wherever needed.*
- *Malaria treatment guidelines and other aspects of malaria may be communicated through publications in professional journals, bulletins newsletters, and/or distributed through small booklets, pamphlets and handouts.*

19. DISTRICT PLANNING / DECENTRALIZATION

- There is a growing realization that the regional disparities/differences are so wide and the development process including health service development so diverse that planning at regional level and at district level particularly is not only necessary but also relevant.
- The understanding of Malaria as a focal disease with its own peculiar socio-epidemiological characteristics adds a new urgency to more decentralised district level planning.
- The whole renewed development and emphasis of the Panchayatiraj concept and structure also emphasises the urgent need and opportunity for this.
- Finally the concept of involving the grassroots community in the planning process now considered to be more relevant, favours this shift as well.

<u>To support this shift of emphasis, we suggest the following action</u>:

- *The urgent development of capacities and capabilities to undertake district planning.*
- *The urgent training/orientation of Health Centre staff particularly MOs in the ability to make local plans based on local data and to involve the panchayat/community in the planning process.*
- *The urgent training/orientation of emerging panchayat leadership to participate meaningfully in the health planning process.*
- *Community level Malaria plans could be a short term goal to support the long term goal of district plans.*

20. EXPLORATION / STUDY / ASSESSMENT OF ROLE OF ISMS AND THEIR INVOLVEMENT

- The role of Indian / Alternative Systems of Medicine in Malaria Control has been inadequately studied and reviewed.
- While some research on some herbs such as Chiraita etc., have been conducted this has been somewhat adhoc. A much larger number of plants have been mentioned in Classical Texts. Many tribal groups in the country also use local herbs (see Appendix J). There is need for documentation of the experience of anti-malaria treatment efforts with these herbs followed by scientific evaluation for large scale application e.g., while the Central Council for Research in Ayurveda and Siddha (CCRAS) has studied and recommended a combination of herbs for Malaria - Ayus-64 (now available in the market at Chirakin) the documentation and dissemination of the studies have been inadequate.
- The dialogue between the public health system dominated by allopathic 'traditionalists' and alternative indigenous system practitioners has been affected by `western cultural bias' on one side and a fair degree of nationalist romanticism on the other side. The former 'allopathises' the whole integration question while the latter 'politicises' the integration effort. Neither of these is a meaningful way to proceed in the matter.

20.1 We therefore suggest the following action

- *A concerted effort be made to involve the practitioners, systems and councils of all health traditions in the country to understand and tackle the malaria problem.*
- *A review/consultation with experts in the field of ISMs be organised to know about the potentialities/possibilities from each system.*
- *An interactive dialogue and research be initiated to build links between the framework of fever in all systems with Malaria and to evolve suitable therapeutic strategies.*
- *Efforts be made to study and strengthen local health traditions and healing practice that may be helpful in malaria especially in areas of epidemics. A scheme may also be made to document and evaluate these local traditional health practices in different regions.*
- *Regular assessment and research of herbals that have antimalarial potential be taken by national drug research laboratories with clinical trials.*

- *An expert panel of physicians and scholars can be formed for timely evaluation and consultation in special areas.*

- *When products of other systems of medicine are introduced in the programme, there should be a wide dispersal of all the information about the product so that a positive climate of integrated efforts is built up.*

SECTION - D

TOWARDS A RELEVANT MALARIA POLICY

21. MALARIA AND NATIONAL HEALTH POLICY

The National Malaria Control/eradication programme is one of several National Health Programmes in the country under Central Government auspices and initiative but operationalised at the State level with the close and active partnership of the State governments and their health service directorates. A National programme therefore is affected more easily by National policies and the emerging trends in the national scenario. The Malaria programme is no exception.

21.1 The National Malaria Programme evolved in the post-Independence phase when there was a National commitment to organising health care and health programmes for the large majority in the rural/tribal community who had no access to health care.

It had strong public health traditions because of the involvement of large number of highly qualified public health practitioners and was organised as a military campaign because of their IMS traditions. It was affected by the overall dominance of the Western paradigm that formed the basis of the health planning in the country. Therefore while the 'western public health' knowledge was used successfully in a community oriented strategy it ignored all the other systems of medicine, local health practitioners, local health traditions and folk health practices. Also it was a relatively more top down professionalism telling people what they should do rather than building a programme with their active involvement.

21.2 After a phase of bio environmental management, Insecticide spraying became a core activity of the programme and inspite of the warning given by astute public health consultants, Insecticides became the 'magic bullets' of the programme leading to the inadequate development of other methods and to a much required plural and flexible programme.

21.3 During the early seventies it was integrated from a vertical programme to a multipurpose integrated health programme with the PHC taking over the entire consolidation/monitoring operation.

While in the initial years it overshadowed all the other health needs and programmes by drawing 40% of the health budget, it was sidelined from the 1970's with Family Planning and Maternal Child Health related programmes becoming the major focus.

21.4 Health has never been a high priority in the country and the percentage or budget allotted for health has always been lower than what is really required for the development of our human potential. The Malaria Programme has therefore also been affected by the overall shortage of funds even though within the Health Sector it got a better deal in the past.

21.5 The rural-urban differential is well established in the country with rural areas becoming significantly underserved because of neglect, in comparison to the urban focus. This is also the overall trend in the malaria situation.

21.6 Much of the budget of the programme especially in recent years has gone to support salaries of an army of health teams; so what is available for operational purposes - diagnosis, treatment vector control, health education etc., is very limited (see box).

The Malaria Budget - a Paradox

The prevalence of malaria is very high right across the length and breadth of the country, with only Kerala and Goa being exception. The National Family Health Survey study in 1992-93 gives a 3 month incidence rate of 3324 per 100,000 population, which means about 105 million new cases every year. The rural areas recorded an incidence of nearly twice that of urban areas. While most states show a fairly high share of expenditure for the malaria program from the total disease program budget, it must be noted that most of it goes to salaries of staff who may not be doing any work related to malaria. For historical reasons most male multipurpose workers (MPWs) get their salary from the malaria department because they were erstwhile malaria workers and today are MPWs who may be doing very little malaria related work. Hence, what actually is spent to treat or control malaria may be a very small amount of the national malaria budget of about Rs. 5000 million which in itself may be quite adequate to fight malaria under a comprehensive health programme.

- Ravi Duggal and Sunil Nandraj
Recent Trends in Financing

In the Malaria Programme as the above box item shows this is equally true.

21.7 The Drug Policy in the country is another policy which has a bearing on the Malaria Programme and the malaria situation in the country. The formulation of the drug policy by the chemical ministry has ensured that priority is given to the needs of the drug industry rather than the health needs of the people. So though anti malarials was included in the essential drug list in more recent years the overall commercialisation, privatization and liberalisation is allowing the 'anti malarials situation' especially brand products becoming more irrational and market oriented. (see Section 8 and Appendix - D for details).

21.8 In the last two decades the major preoccupations of the Health Care system has been FP and MCH often at the cost of other equally urgent needs. Malaria has been neglected and sidelined in this process. This is particularly significant at the PHC level where MPW's male and female have reduced actively their levels of involvement in Malaria Control Strategy. The diminished presence of laboratory technicians all over the country has further worsened the problem (See separate Section 6).

21.9 It is now well established in policy circles that 70-75% of health care is provided by the practitioners and other alternatives of the private sector (the Voluntary agencies being a small part of it). While in practice this has meant that over 75% of the Malaria cases seek first line care outside the system the continuing focus of Malaria Control Strategies on and through the PHC and the failure of the Malaria programme policy makers to actively study the whole health care situation and make full use of the presence of other services has been a major policy lacunae. While this is being recognised gradually (see later chapters 16, 18 and 20) the efforts are still rhetorical.

21.10 The 1982 National Health Policy was a comprehensive statement Post - Alma Ata as well as post ICSSR-ICMR Health for all policy formulations the early 1980's saw an increasing possibility of radical change. The recognition by ICSSR/ICMR that

'the present health care policies, programmes and health care delivery services and systems had failed to improve the health status of a large section of the people very significantly' and that the alien curative model would not meet the health needs of the people was a significant development. Since over 14 years have passed - there is urgent need to revise the National Health Policy but all the same, some key observations and formulations of the framework of policy are as relevant today as in 1982.

21.11 However this radical possibility was short-lived and very soon after, the economic crisis of the country and the overall global crisis led to the evolution of the New economic policy and the concomitant phase of LPG - Liberalization, Privatization, Globalisation.

21.12 India has now embarked on a major programme of economic liberalization of reform in the early 1990's with various objectives which include :

i. enhancing the role of market forces,
ii. providing a larger economic space for the private sector, and
iii. aiming at a closer integration of the domestic economy with the global economy.

The programme of economic reforms aims at higher growth rates and enhancement of resources to deal effectively with the challenges of poverty reduction and human development. However until these reforms are well underway and stablised the social costs will be high. These will include cutbacks in employment and in investments in social sectors and infrastructure; and health care will be no exception.

21.13 The Government has denied that these reforms will affect the health budget or that of related ministries like Family Welfare, women and child development, Welfare and Education and Rural development. Their share of the budget has increased from Seventh Plan (1985-90) - 26 percent to 37.7 percent in 1992-93 and 43.3 percent in 1993-94. However there is increasing concern that the reforms in the long run will affect investments in the health sector. Already some cuts in the Malaria and TB control programmes have been announced and others are likely to follow in the years ahead.

The India country statement of the Department of Family Welfare (Govt. of India) at Cairo (Sept. 1994) also notes, "***There are real risks to the poor from the reforms: adjustment hurts before it helps. Labour is laid off before growth creates more employment. The long run success of the adjustment programme and of India's fuller development requires much greater attention to human resource development. In the context of population stabilization and sustainable development, it is all the more important to break the nexus between high fertility, poverty, ill health and poor education***". Development and Health planners have very major challenges ahead in this evolving scenario.

21.14 It is too early to categorically state that NEP is anti-malaria programme but there are enough indications already that this will be so.,

i. Budget cuts have resulted in reduction of operational budgets of the malaria programme and infact it was so drastic that the 'World bank' had to invite the government to go slower!!

ii. Privatization is beginning to mean privatization of vector control activities etc., and as in Rajasthan this has shown its results - with market economy factors taking over and operations being stalled because "the rates that were given to the contractors were not sufficient for them to start spraying".

iii. Malaria control is becoming part of International Public Health Market economy with a massive world bank loan being negotiated - which is a loan and not a grant, with its own implications in the years ahead, especially when it will have

to be paid back with interest.

iv. There are indications that the costs of health care are already going up due to NEP and in the absence of safety nets the poor will be most affected by it. Malaria treatment will also reflect this trend. Privatization is also increasing irrationality and commercialization of malaria treatment in the country.

21.15 While this is a serious development and needs to be monitored urgently the warnings of the events ahead and the implications are already beginning to be heard. While exploring the social context and background causes of the Rajasthan epidemic, Dr. Banerji of the Nucleus for Health Policies and Programmes observed that ***"The massive cuts in the health budget, both at the state and central levels, was probably the last straw which broke the back of the programme, leading to almost unchecked malaria epidemics in different part of the country. As expected, the forgotten people, who are compelled by circumstances to live under the most unfavourable environmental conditions, have to bear the brunt of the unpardonable acts of commission of these who have run the programme'***.

21.16 In conclusion Malaria control strategies are now closely linked to the evolving National Health Policy scenario and trends and possibilities will depend on how the scenario develops further as we reach 2000 A.D.

21.17 ***We believe that Programme and Policy Planners in Malaria Control must actively study and contextualise the wider socio-economic-cultural-political context in which their strategies must be located. A broader context of public policy must therefore inform their deliberations, their understanding and their strategies for action, research, training and evaluation.***

"Medicine has indeed delivered effective answers to some health problems and it has found the means to lessen the symptoms of many others. But by and large, we remain with the necessity to do something about the incidence of disease, and that means a new partnership between the health services and all those whose decisions influence the determinants of incidence.

The primary determinants of disease are mainly economic and social and therefore its remedies must also be economic and social. Medicine and politics cannot, and should not, be kept apart."

— G. Rose, Epidemiologist, LSHTM

22. HEALTH HUMANPOWER DEVELOPMENT AND TRAINING ISSUES

An important aspect of MALARIA CONTROL which is crucial to its success and viability is the development and deployment of adequate trained human power at all levels of health care.

It is of great concern to note the rapid quantitative disappearance of the man power trained in malariology (including laboratory as well as field). This has resulted in serious problems and delays in the diagnosis and proper management of malaria cases leading to deaths and emergence of drug resistance. Besides, there has been gross under-reporting of actual cases (number) of malaria as a result the magnitude of the problem could never be assessed correctly leading to ineffective intervention.

(In absence of lab facilities, malaria deaths will be reported as fever deaths. Deaths due to fever should also therefore be documented and monitored as additional evidence of the problem.)

22.1 Suggestions for Action

- *Training of all categories of Government staff, involved in malaria control should be undertaken with immediate effect. The training should cover all aspects :*

  i) Laboratory diagnosis, ii) Clinical diagnosis, iii) Management and reporting.

- *Volags should be encouraged to join the Government activities and persons working with Volags should also be included in the training programme.*

- *Private profit making diagnostic laboratories must be asked to recruit Lab. Technicians who possess adequate training in malaria microscopy from authorised Institutions. The already existing technicians who do not possess such certificate must be asked to undergo such training course. Otherwise, no laboratory should be allowed to continue and the operating License should not be renewed.*

- *In this regard, NMEP should establish collaborations with Teaching/ Research Institutions involved in Malaria work, who should be funded by the NMEP to act as Resource Centres.*

- *In the past there was a well established subject of Malariology and courses, that provided training in malaria in a multidisciplinary environment in the inter-connected areas of Epidemiology, Entomology, clinical medicine and treatment, public health and public health engineering. NICD used to run the training programme. With the phenomenal resurgence of malaria it may be necessary to revive this subject and promote short term training for all Medical Officers involved*

in the programme at all levels - especially decision makers and administrative workers.

- *Short term updates at district level and state level may also have to be carried out.*

To operationalise this, there is <u>urgent need for people with interdisciplinary malaria competence</u>.

22.2 Building Trained Human Resources

With the earlier decline in levels of malaria the discipline of malariology itself took a back seat with hardly anyone receiving training in this area. With the increasing problem of malaria it is necessary to look at malariology again with a functional focus rather than an academic focus. There is a need for the following categories of personnel to be trained in various aspects of malariology. They are:

Volunteers (PHC)	- IEC - Preparing slides - Helping spraying insecticides - Presumptive treatment in select areas (minimal educational qualifications expected).
Smear Technicians (District/PHC)	- Preparing slides - Reading slides and reporting presence of malarial parasites and of what type. (there are educated persons in the community atleast 10th standard pass who can be trained in this capacity).
Laboratory Technician (District/State)	- While basically laboratory technicians are trained in identifying malaria parasites in blood smears, those who are trained in centres located in low prevalenceareas may not have adequate experience. Therefore, Lab Technician may be taken through a crash course on ■ Making correct smears ■ Reading blood smear for MP and ■ Indicating type of malaria.
Multipurpose Health Workers (Male & Female) (District/State)	- These level of personnel need to be trained in interacting the community and therefore need training in ■ Epidemiology of malaria ■ IEC on Malaria ■ Making correct smears of those with fever Training may be integrated in regular curriculum plus follow up refresher course.

PHC (State / Centre)

- Since most MO PHC are generalists, it is essential they be additionally trained with focus on malaria especially in endemic areas. (Since many young doctors are ignorant of malaria all new recruits in endemic areas may be initially trained in Malaria control before posting in the PHCs).

DMO/State level officer
(State / Centre)

Areas of training

- Epidemiology in general and Malaria in particular.
- Entomology
- Slide preparation and reading
- Clinical skills in malaria
- Treatment
- Prevention strategies
- IEC
- Engineering aspects of prevention of malaria.

22.3 In this manner Personnel at various levels could be trained for Malaria Control the broad principles are

- Strengthen existing malaria workers
- Strengthen training programmes in existing institutions
- Introduce malariology in more training centres
- There is a need for multi disciplinary or multi functional malaria personnel
- Provide emphasis on different aspects of malaria needed at different levels
- Provide malaria training to PHC/Volag health staff who normally may not be involved in malaria but who can plan an effective role
- A module on malariology needs to be developed and trainers be initially trained

Check and monitor the competence and efficiency of existing training centres.

22.4. Availability and Utilisation of Available Manpower

Some of this aspect is discussed in relation to integrating malaria control in PHC. In this section it is more personnel specific.

1. Filling of Vacant Positions

Today, there are trained personnel available for most functions. However, there are ***undue delays in filling vacant positions***. Lack of trained human resources in position is one reason for malaria getting out of control.

2. Defining Functions of Workers

Moving away from unipurpose workers who were initially trained for only one function it is necessary to define the role of workers so that malaria, among other activities is clearly listed as a job function.

Lab Technician - Diagnosis - Smear collection and microscopy

MPW	-	Smear collection, IEC, treatment, prevention
Doctors	-	Clinical, diagnosis, treatment, IEC, prevention, epidemiology, monitoring and supervision.

3. Focus on High Risk Areas

With epidemiological data available on the area specific prevalence of different types of malaria appropriately trained personnel may be posted in high risk areas and also train local personnel to meet the needs of malaria control.

4. Rational Transfers

With emphasis on specialisation in the medical field many post graduates are available in different disciplines. However, sometimes transfers are made without adequately looking into the qualification of such personnel. An eye specialist or chest physician posted in a malaria endemic area may not do justice to the problem of malaria.

5. Supportive Facilities.

There is need to provide supportive facilities for the existing NMEP staff so that their morale and motivation are high. This includes TA/DA/Workshop opportunities, motivations, incentives and other opportunities. The most important factor is enthusiastic and supportive leadership(!).

23. LOSS OF PUBLIC HEALTH SKILL / COMPETENCE

* ***The National Malaria Eradication Programme as well as all other health programmes in India is being greatly affected by the crisis of "Public Health" in the country, marked primarily by the increasing disregard of 'public health competence' and public health perspectives in health policy and health care decision making.***

* ***At Central and State levels there is increasing marginalisation of technical leadership with public health competence, by their clinical counterparts and both these groups by lay generalist administrators. Decisions that therefore need sound epidemiological and technical background are now being increasingly taken by those who are not adequately qualified to do so. Specious arguments based on management/economic/or other extraneous factors are therefore being allowed to modify policy planning process.***

* This is further compounded by the inadequate support to public health training in the country whose growth in quantity, quality and diversity today are totally out of context of the large needs in the country.

The MEG therefore suggests

- *Serious effort be made to strengthen public health training in the country;*
- *Ensure that key decision makers in health care services and policy making bodies have public health competence and orientation;*
- *Encourage existing Public Health and Preventive and Social Medicine/ Community Medicine/Community Health courses in the country to be more field oriented in their priorities and skill development;*
- *Build inservice training and continuing education programmes for all categories of health personnel in public health skills/knowledge including communicable disease control focusing on national programme related issues; and*
- *Re-establish - Malaria related training courses in some select centres of the country to create a new cadre of leadership for the future.*

24. MALARIA RESEARCH CHALLENGES

The National Task Force on Revised Strategy for control of Malaria (1993) has reiterated the importance of Research back up for Malaria control and has recommended that "Need based laboratory and field research directly linked to local demands for malaria control activities, generated by district micro plan should be supported at the national and regional levels."

It then highlights areas of research which include epidemiology, chemoprophylaxis and antimalarial treatment, clinico parasitology, entomology, parasite characterization, socio-medical aspects of malaria, field operational research and health services research. It also highlights specific issues in each of these areas and suggests some initiatives to build this dimension of malaria control strategy further. We fully endorse these recommendations and feel that a much more concerted and serious effort must be made to operationalise the comprehensive suggestions. However, we have some concerns and suggestions that would reinforce the recommendations of the task force and perhaps complement it as well.

24.1 National Malaria Research Network

First, we recognise and appreciate that researchers in institutions like MRC and its field stations, VCRC, NICD, NIHFW and others have been doing research that is relevant and exploring ideas and alternatives that are of significance to the programme. However, their links and coordination with NMEP are somewhat adhoc and the relevance of the investigations are not always central to the emerging operation/research and field research needs of NMEP. We believe that the **coordination between NMEP and these National research institutions and centres** should become integral to the future programme but the committee/network formed for such an integrated purpose should also pull in expertise of researchers from medical colleges and health policy research groups in the voluntary sector and the non-governmental sector. The network need not be a bureaucratic initiative but an informal network of experts that share ideas, brainstorm and guide and coordinate research, exploring new challenges and preventing duplication of efforts.

The NMEP has an opportunity of making the NMEP- ODA linked Surat Malaria project as the focus of such an informal networking. The historical Narangwal project brought together not only collaborating institutions but a larger network of policy makers and service providers, to regularly consider the findings of the study and dialogue on their applications and implications had a major impact on MCH services in the country. A similar process could be initiated in Surat and this would have a wider qualitative impact of the project.

24.2 Dissemination of Research Findings

While most of the research being done, does get published in National and international journals and also presented at national and international conferences, there is **urgent need to disseminate the significant findings and salient features** of ongoing projects in a more active way to all those individuals, project and for a concerned with Malaria as an important public health problem. A bulletin for this purpose or some other creative communication strategy could be an excellent initiative for government-Volag collaboration. It is equally important that key findings get translated into guidelines for action and these are transferred to the field through operational manuals and information booklets and even to the community through effective health education. The challenge is to keep 'research' and 'action' in a dynamically linked situation.

24.3 Enhancing Socio-Cultural Epidemiology and Operations Research through Collaborative Research

As mentioned in an earlier chapter (3) there is urgent need to get beyond a techno-managerial focus to a larger wholistic socio-economic cultural-political context of malaria control in India and strengthening the behavioural sciences dimension of all our efforts including research.

We feel that the researchers from the voluntary sector would be particularly able to collaborate and strengthen these aspects of research focusing particularly on

- Knowledge -attitude-practices-behaviour of people in rural, tribal and urban areas
- potential role/involvement and/or mobilization of the community, community organisations, panchayatraj institutions, general practitioners, Alternative systems of medicine and folk health practitioners, voluntary agencies, and projects and networks of development environment and women's groups.
- Role, training and process of monitoring and continuing education of village based health workers, community level resources persons, village guides etc.
- Evolution and operationalisation of community based approaches and alternatives to malaria control exploring viable, feasible, sustainable options and strategies of malaria control in response to the diversities and disparities that one finds at the community level.
- Much of this collaboration research would be field oriented, operational research and/or action research. ***We believe that exploring the 'social paradigm in malaria' is not just one more area of research but probably the core area if the 'resurgence' has to be tackled effectively in the years ahead because in many ways it has also been the 'neglect' of the 'sociological/societal' issue in problem analysis that has caused the setback***.

24.4 Research on Appropriate Technology

Research on evolving new possibilities and/or adapting innovations in technology at diagnosis, chemotherapy, vector control or environmental management must be promoted and encouraged. However the cost factor and the 'equity' factor (i.e., applicability and accessibility to the marginal sections of the community) must always form an important core of the technology testing process. It is also important to locate the technology in the community's context and make it subservient to people's needs and not the other way around of making people subservient to technology marketing.

24.5 Lab to Land Process

Ultimately until all the research undertaken in the country is geared to an urgent and efficient transfer from 'research funding' to 'action guideline' (the so called Lab to Land transfer that has worked so effectively in the Agricultural development sector making the green revolution possible) there is a danger that the limited resources available for Research could get wasted or marginalised and not inform or stimulate concrete malaria policy.

24.6 While making an urgent plea for the harnessing of more researchers into operations and field research in communicable disease control including Malaria control we believe that

a research network;
a creative research bulletin; and
collaborative projects between government and non-government sector especially in operations research, action research and socio epidemiological, and field testing of appropriate techniques and technology and effective lab to field programme will make existing research efforts more cost effective and relevant.

Operational Research

Malaria control programmes need to develop the capability to undertake applied field research on issues of direct relevance to control objectives. Such research should be conducted by health personnel with assistance from research institutions and other groups. The objectives and design of operational research projects should be established within countries and should be closely tied to the particular problems identified during planning, implementation and evaluation of control programmes at all levels. Those who will have to implement decisions made as a result of the research should be closely involved in the research process, so that they are committed to its conclusions.

The research should address not only the efficacy and cost-effectiveness of specific interventions, but also related areas that influence them and other components of programme and management activities. These will include capabilities for effective epidemiological response; community perceptions of malaria and treatment practices; the effectiveness of referral systems; the implementation and effectiveness of antimalarial drug policies; career structures; the impact of migration and of ecological and environmental changes on malaria; training and health education for staff and communities; and programme evaluation.

Source : WHO Technical Report Series 839 page 50

25. FORECASTING / MONITORING AND CONTROL OF MALARIA OUTBREAKS /EPIDEMICS

The formation of MECUs - Mobile Epidemic Control Units - at District level is a welcome step towards meeting the need of assessing and analysing the relevant surveillance data at peripheral level and cutting down the reaction time in responding to forecasts of/or early detections of epidemic.

Much details have also been worked out in the MAP guideline specifying the methodology for monitoring and cross checking of surveillance data, of rapid delineations of outbreak affected areas and early liquidation of foci by comprehensive measures. As a group we endorse all this.

However, it is suggested that

- *Being a resource strapped nation, the MECU should have its role broadbased for other epidemic prone diseases like Measles, Gastroenteritis/Cholera, Dengue, Japanese Encephalitis etc.*
- *The team needs to make visits to each PHC at least once a month where it can help and motivate the PHC staff in maintaining documents upto date, analysing their own data and in visiting identified "trouble spots" to suggest quick field measures. Where possible Volags involved in malaria control in the area should also be visited/motivated.*
- *The Medical Officer should be trained in epidemiology. Alternatively, we could have a senior epidemiologist heading the team with one medical officer specifically earmarked to move at short notice (and one reserve) at the district level and they should be answerable not just to the CM & HO of the district but should also be reporting once a month to the district administrative authorities to improve and advice on intersectoral coordination.*
- *There needs to be more emphasis on ensuring that this unit remains mobile at all costs. The District vehicle pool being larger, should be the source from where, in case of breakdown of the unit's vehicle, a good vehicle must be provided at short notice. Turnover of vehicle from MECU to other departments every two years can be also resorted to.*
- *The MECU should be provided with teeth too. It must be mandatory for it to submit a post-outbreak/epidemic report to both the health and administrative authorities identifying the reasons and affixing responsibility for the epidemic. It must be incumbent on the administration to take prompt action based on this report.*
- *Last but not the least, contingency funds must be available to the MECU to ensure that the vehicle or equipment is functional at all times. Similarly, the funds may also be necessary to telephone/fax messages to the District/ Zonal medical teams or district authorities from field.*

26. MANAGEMENT INFORMATION SYSTEM

Although the Management Information System outlined in the MAP manual does adequately cover the records of drugs and pesticides supplied and used, of laboratory slides and their results, of tour reports of various officers incharge to their subordinate centres, and have even covered adequate heads to enable a central computerised system, the need to address the following will go a long way in making the exercises meaningful:

26.1 A regular feedback based on the analysis of all data collected must be passed downwards to the field staff which shall help to:

1. ***ensure that the collating agency reads and analyses the data to make the process relevant, promptly and regularly.***

2. ***enthuse the field staff in providing their relevant inputs because they identify their contributions to the management system.***

26.2 A report on a monthly basis regarding the authorisation, posting and leave status of various categories of manpower and a reverse monthly report top downward on action taken for the previous month's deficient state (if needed) should be initiated to highlight the problem and keep it alive.

26.3 A report on the administrative state of staff e.g., of last pay drawn, back dues from and balance of TA/DA bills can also be asked for, besides lack of accommodation etc., to give a chance to the staff to project their problems to higher ups. Similarly a point to point redressal of complaints must be sent back by the higher echelon in hierarchy.

6.4 ***The prompt and correct submission of reports must be insisted upon with firmness so as to lend credibility and responsiveness to the system.***

(See Appendix - L for details of an alternative suggested)

27. CORRUPTION / POLITICAL INTERFERENCE IN POLICY DECISION MAKING

While techno-managerial and some epidemiological causes of programme inadequacy and/or failure have been constantly highlighted in all evaluation/reviews/studies of the 'implementation gap' in national health programmes including malaria - two extraneous factors that are important, known to most researchers, experienced by most programme planners and programme implementors but inadequately tackled or even described because of the difficult nature of the problem are the following:

a) ***Corruption manifested particularly at the time of tender, bulk purchase, appointments, and transfers. These involve bribes and pecuniary benefits to decision making leadership. Often there are well developed systems with the collections shared by a larger section of the system.***

b) ***Political interference in decision making at all levels even to the point of disregarding technical expertise. This is the bane of Indian Public life today. The involvement of lobbies of drug companies, insecticide manufacturers, irresponsible trade unionism staff and all sorts of extraneous influences seem to be at play when variances from policy statements and actual realities are discovered by evaluators/researchers.***

Selection of what should be introduced and what should be kept as second line etc., in drug treatment or insecticide spraying etc., are therefore not based on sound public health principles, epidemiological significance and operational feasibility including costs factors, but are subservient to these extraneous factors mentioned above.

While these are part of a larger problem, we suggest :

- *A policy of greater transparency in decision making involving tenders and contracts associated with drug/pesticide purchases from the private companies.*
- *A greater sharing of information / with increasing emphasis and legal sanction to right of information. These will go a long way to allow consumer groups and social activists to play the necessary watchdog role on the system particularly in these aspects.*

28. INTERNATIONAL PUBLIC HEALTH COLLABORATION

- Malaria is a major public health problem in India and a serious global problem as well. It will require concerted national efforts, strengthened by regional collaborative efforts and the resource support and linkages of international funding agencies and international Public Health cooperation.

- In the present global scenario and the evolving market phenomena , there is a growing danger that Malaria funding will get linked to marketing of specific products or approaches at the cost of a more integrated / comprehensive strategy.

28.1 The Indian programme is supported by WHO/ ODA and World Bank is becoming a major player. While these collaborations are welcomed, **we <u>suggest</u>** that the project linkages, project funding should primarily.

- *Strengthen national capacity to deal with the problem.*
- *Build national infrastructure especially trained and skilled multidisciplinary manpower.*
- *Be rooted in approaches/strategies responding to local needs and socio-economic-cultural-political realities of the country and arising primarily out of local experience.*
- *Prevent national strategies/projects becoming subservient to the priorities/ needs of international funding agencies, institutions and resource persons whose understanding of local socio-epidemiology is often rather limited and who may inadvertently promote the research, training and programme agendas of their own institutions/agencies rather than being supportive of local expertise.*
- *Ensure that projects / linkages are transparent and subject to collective peer group dialogue and interaction among all those who are seriously involved and interested in 'malaria' as a public health problem in the country.*

29. CENTRE STATE RESPONSIBILITY

An important component of Health Policy is the financing of Health care programmes. In the Indian context 'Health' is a state subject in the constitution and the centre can only set norms or organise programmes that supplement / complement the states own Health care efforts. However, the concept of a National Health Programme has created a situation where the centre, due to excessive centralization oversteps its limits and evolves and controls a National Programme and makes the state a passive collaborator or partner. Centrally sponsored programmes can provide 100% sponsorship or as in Malaria, the Central Government and state government agreed to support 50:50. Usually the Central contribution meets certain items/components of expenditure while the state agrees to meet other components from its 50% share. In the humanpower context usually ANMs or MPW-F are supported by the Centre while the MPW-M and the lab technicians are supposed to be recruited and supported by the State. When the state does not provide its share, the Centre continues to give its share without conditions. This makes the state unaccountable and the health care systems bears the brunt of this distortion. One of the key factors in the weak situations of Malaria control today is this continuing non-employment of MPW-M and lab technicians by the State Government. But the Central government, rather than insisting upon the state meeting its commitment has continued passively to support its share of the programme. The results are overworked female health workers and understaffing of the two most crucial workers for the Malaria programme. How is it possible to provide the necessary services or maintain the strategy? This is the tragedy of Malaria Control explaining why the system has passively put up with 50-75% levels of vacancies.

29.1 This dilemma is not a new one. In 1993, the National Task force had noted it as important constraints and issue of concern as well:

> "States have failed to sanction and establish PHCs/sub centres as per prescribed norms. Those established have not been provided with adequate staff, equipment and budget. Inadequate funds and low priority with the state governments are responsible for non establishment of PHCs as per norms. As per government of India norms one PHC with laboratory was to be established at 20,000 population in tribal areas and 30,000 population in other areas. This has not yet been fully implemented , to make laboratory services available to the remotest area".

States have failed to match central allocation on 50:50 basis, due to low priority to malaria problem, and lack of resources.

29.2 We believe that a time has come to make the National programme different in its orientation.

a) The States must be asked to meet the total operational costs of the programme.

b) The Centre should provide technical expertise, training, consultancy support to publications, IEC etc., which are conditional to the humanpower situation being totally made up.

c) However, since some factors such as movement/migration of people from one place to another cannot be curtailed in a democracy and inter-state migrations are probable, the Centre cannot deal with each State independently and must build up consensus and collective commitment to the problem solution as well.

While this will be resisted by the states, it is important to make a drastic policy change in the 9th plan and seriously consider this proposition. Increased State government commitment to health infrastructure and health programme costs will

greatly stabilise the programme and both responsibility and involvement will be generated simultaneously. An effective filling up of the vacancies of the MPW-M posts and that of laboratory technicians, will give a major boost to the existing programme.

30. NMEP AND OPERATIONAL MANAGEMENT AT VARIOUS LEVELS

Preamble

Malaria control all over the country except Defence, Railways and a few special agencies rests with the National Malaria Eradication Programme (NMEP). Availability of the drugs, insecticides and other supplies and equipment to the States is done by NMEP. The Regional Offices of Health and Family Welfare (ROH & FW) are responsible for all major health activities supported by Government of India (GOI). Their responsibilities include coordination, supervision, training and monitoring programme performance including malaria control.

The State level organization has a cell consisting of an epidemiologist, an entomologist and supporting staff. There are zonal organisations to coordinate the activities between 4 to 5 districts of a State. These zonal units consist of an epidemiologist and entomologist.

At the District level and below all health programmes are integrated. There is a district malaria officer (DMO) under the Chief Medical Officer of the district. The most peripheral workers are the multi-purpose workers at the Sub-Centre level.

30.1 While the organisational set up of NMEP has been in operation for many years with review and adaptation from time to time, there are some issues of concern at the operational level of NMEP:

1. ***No Strengthening of NMEP to meet the changing situation***: Basically, the structure and specialisation of NMEP Directorate has not changed since its inception to meet the changing situation particularly in the field of epidemiology, medical entomology, public health engineering, research and development component, etc.

2. ***Lack of adequate involvement of the States in the planning process for malaria control***. At present, for all practical purposes, the planning is done at the national level and implemented by the States.

3. ***Ineffective organisation, administration and execution of the malaria programme at the State and peripheral levels*** resulting in lack of impact on malaria situation.

4. ***Lack of active involvement of ROH & FW in Malaria Control***: Because of lack of trained infrastructure , the ROH & FW are not able to carry out effectively coordination, supervision, training and monitoring of malaria control programme in the States attached to each Regional office.

5. ***Non involvement of DMO in planning and implementation of spray operations***. Entrusting spray to private contractors/ voluntary groups, etc., in some States.

6. ***Lack of efficient surveillance for early case detection and timely intervention measures*** by the District Malaria officer/District Health Authorities.

7. ***Delay in release of funds to the District Malaria officer*** by the State governments with the result that spray operations are not carried out effectively.

8. ***Delay in release of funds earmarked for control of malaria to local bodies by the States***.

9. ***Lack of adequate referral system for malaria under the primary health care delivery system***: Serious complications due to malaria are common in children, in pregnancy and in ***P.falciparum*** infection. Management of severe cases of malaria require immediate administration of life saving drugs which are usually not available at the PHC level. The referral services at the Sub-Centre or even PHC level are inadequate which causes high mortality among severe malaria cases.

10. ***Inadequate health infrastructure and lack of treatment facilities at the village level***: A major cause of malaria outbreaks and epidemic situation reported from various parts of the country is the breakdown in the surveillance and the drug distribution network. Malaria cases unable to find drugs approach quacks and suffer extended morbidity. Deaths due to malaria are mainly confined to areas with shortage of drugs.

We suggest the following policy initiatives to strengthen the organisational context.

- ***Restructuring and strengthening of NMEP for an effective delivery of malaria control*** *. The NMEP needs to be strengthened on a priority basis in the field of epidemiology medical entomology, public health engineering, monitoring, evaluation, research and development and the behavioural sciences.*

- ***The State level organisation needs to be strengthened*** *in the field of epidemiology and entomology and behavioural scientists to carry out periodic adhoc surveys in different areas for formulating effective malaria control strategies in those areas.*

- ***It is the responsibility of the State government to strengthen the organisation, administration and execution*** *of malaria programme at the State and peripheral level for effective impact.*

- ***The State malaria organization should be in the position to forewarn the impending epidemics*** *following natural disaster and plan for implementation for epidemic prevention through the district health organization.*

- ***The ROH & FW should be actively involved in*** *planning, training and monitoring of NMEP in their respective areas, for which their staff should be trained and motivated.*

- *The Zonal organisations should be strengthened by providing training on present day concept of malaria control and facilities for utilising their services effectively.*

- ***The DMO / District Health Authorities should continuously monitor efficiency of case detection and timely intervention measures*** *vis-a-vis malaria incidence in the community.*

- ***The DMO/District epidemiologist should be responsible for the training of staff working in the district*** *for malaria control in close collaboration with other concerned disciplines particularly medical care.*

- ***The DMO should be responsible for planning and implementation of spray operation in the district****. The supervision/implementation of spray should not be entrusted to private contractors.*

- ***Joint responsibility with local bodies under the urban malaria control programme****: The actual implementation should be under the local bodies but the cross checking activities could be entrusted to the NMEP.*

- ***Funds should be released by the State Governments to the DMO in time*** *so that spray operations are carried out in time with good coverage.*

- ***The funds earmarked for control of malaria in Municipalities/ Corporations under Urban Malaria Scheme*** *should be released to the respective local bodies by the State.*

- ***Organisations having adequate funds should develop the competence to carry out malaria control programme themselves e.g.,*** *(i) industrial sector (ii) tea and coffee industry (iii) military and paramilitary and police organisation (iv) Border Road organisation (v) River Valley Projects for Irrigation (vi) mining projects (vii) rehabilitation projects (viii) airports and seaports and (ix) roads and buildings.*

- *Adequate referral system for malaria under the primary health care system should be developed. As many of the life saving drugs and equipments are not available at PHCs, so referral services to other institutions where such facilities are available should be developed.*

- *Development of adequate health infrastructure and treatment facilities at the village level through the involvement of Volags: The Volags working on health issue should be involved in early detection and treatment of malaria cases at village level. Such organisation can be given adequate training, anti-malarials and equipment for collection of blood smears of malaria like fever cases, etc. (see also section 16 & 17).*

SECTION - E

A COMPLEMENTARY STRATEGY AND ALTERNATIVES FOR ACTION

31. TOWARDS A COMPLEMENTARY STRATEGY OF MALARIA CONTROL

31a. Supplementing Existing Strategy

In previous chapters we have reviewed various aspects of Malaria control and discussed many issues of concerns and some suggestions for alternative initiatives.

1. ***A initiative to make available to the present generation of planners and health action initiators-documentation of past experiences and strategies to inform our current efforts and policy.***

2. ***An initiative to identify the veterans of the earlier phases and involve them in reviewing evaluating the current challenges so that we do not re-invent the wheel but learn from the past in our efforts to harness action for the future.***

3. ***Introduce compulsory notification of Malaria cases (perhaps simultaneously other key communicable diseases as well -TB, Cholera, Dengue, Filaria, Kalazar, Plague and so on) so that all health care sectors including GPs, voluntary sector, private hospitals etc., contribute to estimation of the actual problem and epidemiological situation.***

4. ***Improve existing surveillance system by***

   - ***Motivating PHC team to provide true picture by making system more efficient, reliable and valid.***
   - ***Provide active feedback down the line so that providers of information are informed of trends and implications.***
   - ***Integration of record keeping and simplifying/ rationalising data collection.***
   - ***Introducing a parallel surveillance of checks /surveys /independent evaluation by medical colleges and other agencies outside the system as a supportive supervision.***

5. ***Build up a system of prompt dissemination of information and capacity building upto district level so that flexible and appropriate responses can be initiated for malaria control at district and subdistrict level keeping in mind the focal/local nature of the problem and the increasing diversity of the epidemiology.***

6. ***Monitoring the problem of Drug and Vector resistance more actively and dissemination of this information widely so that the system is responsive to the emerging situation more effectively.***

7. ***Strengthening the Entomological assessment/monitoring capability at state and district level and tackling the acute shortage of entomologists in the programme as well as providing greater support to those who are in the system at all levels.***

8. ***Monitoring the seasonality of Malaria transmission and the effects of climate changes including EI Nino phenomena etc., and ensuring that this information is actively disseminated to plan control programmes effectively.***

9. ***Introducing an organised surveillance system to monitor migration of populations in the country as an intersectoral initiative with all the concerned ministries (agriculture, irrigation and power, labour, industry, works, housing, and rehabilitation,***

environment, etc.) so that the malariogenic potential of migration is monitored and preventive action is enhanced rather than continuous fire fighting and crisis intervention.

10. *Ensuring strict pre-project Environmental impact assessment of all developmental projects in all sectors that are likely to enhance malariogenic potential, by building this component effectively into the licensing systems. Building EIA competencies in the country as a supplementary initiative.*

11. *Promoting regional, district level, decentralised planning as a logical corollary to the increasing focality/regionality/ diversity of malaria epidemiology but also as a more effective and viable strategy for health policy planning. Creating the administrative guidelines for such a shift of emphasis as well as a communication strategy to tackle the blocks and mindsets of earlier centralised planning.*

12. *Prioritising efforts of both Governmental and Non-governmental including voluntary sector programmes and initiatives in the problem areas already identified by the Malaria epidemiological surveillance system i.e., hard core areas, epidemic prone areas, developmental project areas, triple insecticide resistance areas and urban areas.*

13. *Promoting understanding of Malaria ecotypes and malaria paradigms and strengthening the malariogenic stratification system presently being operationalised by NMEP so that this would inform effective public policy generation of programmes and action thrusts.*

14. *Coordinating the programmes and action initiatives of Government and non-government agencies in the vector borne diseases to begin with Malaria, Filaria, Kalazar, Dengue, JE, Plague and later with all communicable disease control programmes.*

15. *Strengthening greatly and on an urgent basis - the socio-cultural-economic-political dimensions of problem analysis and problem solution in Malaria control by behavioural sciences orientation at research, planning and training levels. To begin with to build up this expertise at central and state levels especially NMEP, MRC, VCRC, Central and State Directorates, so that the dominant techno managerial focus is balanced by relevant socio-epidemiology.*

16. *Strengthen the multidisciplinary nature of the present planning process for communicable disease control in India using Malaria programme as the first step. Building sociological, anthropological, psychological and economic competence in the system.*

17. *Involving Health Economists actively in the situation assessment and programme planning so that decision about choices and alternatives and effects are based on more rational economic and socio cultural parameters.*

18. *Urgently strengthen the diagnostic capacity of Malaria control programme structure at the periphery by*

    - *Urgent filling up of vacant posts of lab Technicians in the PHCs in all states*
    - *Management and logistical efficiency to reduce timelag between smear preparation and diagnosis.*
    - *Enlarging the operation of diagnostic facilities by strengthening/orienting and involving voluntary sector and private sector in the programme.*
    - *Enhancing training facilities, course accreditation and continuing education for*

lab technicians.

- *Establishing an Allied Health Professionals Council at centre and State levels to focus on needs/orientation of Lab Technicians developments along with other categories of health workers as well.*

19. *Improving Malaria clinical diagnosis and recognition skills at all levels through a serious and urgent continuing education programme in coordination with IMA, medical colleges and other professional associations. The development of Diagnostic Flow Charts for Diagnosis and treatment at all levels would be a complementary initiatives.*

20. *Improving the teaching of Malaria in undergraduate medical and nursing education by initiating an urgent dialogue at national level with medical college networks and consortiums on Malaria in Medical Education and introducing an integrated module of Malaria teaching with the involvement of MCI as was done in Family Welfare and Child Development in earlier years.*

21. *Promoting and enhancing the role of an expert watchdog committee on Rational Malaria care and Rational Malaria Therapeutics and Drug Policy - so that the anti malarials policy is not adhoc but monitored and improved upon in a continuous process and (is supported by regular and comprehensive medical audits/clinical audits.) This committee could consider all the issues we have raised in our report.*

22. *There is need for a regular Prescription Audit body that monitors and audit prescriptions on a regular basis not only for malaria but for all key communicable diseases and national programme related diseases atleast.*

23. *Reconsidering the decision to introduce Mefloquin into the country by appointing a special expert committee to review the decision in light of the growing concern of rational drug policy and rational therapeutic experts on the role of Mefloquin in the Malaria Control Programme.*

24. *Promoting Personal Protective measures at individual and community level using the cafetaria approach that was used in the FP programme, including low cost local cultural health practices including fumigation, neem etc.*

25. *Field testing and assessing appropriate technologies including Impregnated bednets keeping particularly the relevance, accessibility, cost factors in the context of the poorer and marginalised sections of the community during assessment. Also countering the unipurpose thrust in the pormotion of IBNs seen today probably in response to market economy factors.*

26. *Strengthening the Vector control strategy primarily by enhancing capacity for selective, local /focal spraying with insecticide and bio-environmental control at all levels.*

27. *Enhancing the state and local self administrations capacity/ability to ensure proper water and waste disposal and enacting model bye laws to implement the measures under the urban malaria scheme.*

28. *There is urgent need to rediscover the community in Malaria Control Strategy in keeping with the Primary Health Care approach which is a National commitment. The community needs to be actively involved in planning and implementing the strategy accepting them as participants rather than beneficiaries of the programme and the strategy should be directed towards enabling/ empowering the community rather than just providing a service. This will involve in operation terms*

    - *Health Awareness building*

- *Village health committees*
- *Training of village health guides/and or malaria link worker and their support supervision and continuing education*
- *Identification and involvement of all the human resources in the community including panchayat leaders, informal leaders, mahila mandals, youth clubs, teachers and school children, TBAs, GPs, folk health practitioners, practitioners of ISM etc.*
- *Learning from the people and evolving local alternatives with them*
- *Community capacity building strategies*
- *Community based monotoring/evaluation/audit systems.*

29. *A Vigorous, effective and massive Health Education efforts using not only mass media but more significantly other strategies as well.*

- *increasing the budget of health education*
- *promoting folk media and community based interactive - culture sensitive approaches*
- *involvement of media/communication centres in the government, voluntary and private sector*
- *seriously initiating the inclusion of Malaria and other epidemic diseases in the school curriculum at various levels*
- *focussing on making available and orienting most of the health education materials - existing and new productions, towards local languages.*

30. *Evolving a relevant and operational collaborative linkage between governmental and non-governmental initiatives in malaria control by*

a) *active involvement of the three national health coordinating agencies of the voluntary sector -VHAI, CMAI and CHAI and through them an effective mobilization of the 4000 odd health oriented institutions and programmes through their regional networks and associations. The involvement could be in all aspects of malaria control - Diagnosis, treatment, vector control and Health Education;*

b) *collateral linkages with other networks of voluntary sector / focussing on development, environment, womens issues and identifying specific roles for the membership of such networks;*

c) *ensuring that the rich networks of Volags in the country are involved not only as alternative service providers but also as*

i. *health communicaters*
ii. *community mobilisers*
iii. *alternative community health oriented trainers*
iv. *action and operational researchers*
v. *issue raisers and awareness builders.*

31. *To promote the involvement of Volags in Malaria control on a more substantial and concerted basis Capacity of volag network should be built with the promotion of Volag resource centres, and the volag cells in NMEP central and State headquarters and providing adequate funds for promoting and sustaining collaborative initiatives in field action, training and field research.*

32. *Urgent action to strengthen public health orientation and training in the country as well as make it more field action and skills development oriented.*

33. *Active involvement of GPs in Malaria Control programmes by providing updates, continuing education, booklets and pamphlets in collaboration with IMAs, medical*

colleges and other professional bodies.

34. *An urgent orientation and information sharing programme for Panchayat leadership to help them participate meaningfully in the planning process.*

35. *To promote regional and decentralised district level planning by disseminating information to that level and developing planning skills at that level.*

36. *A urgent consultation/dialogue with experts of ISM on*

- *potentialities/contributions of ISM to Malaria*
- *study and strengthen local health traditions and practices that are relevant to malaria control*
- *regular assessment and research of herbal and other alternatives*
- *an orientation of the practitioners on Malaria and its public health related challenges.*

37. *A serious study and continuous monitoring of how Malaria programme will be affected by the NEP and the privatization trends and a rigorous public policy analysis of malaria control in a broader social-economic-cultural-political context.*

38. *A humanpower development strategy for malaria control which will promote*

- *Provision and or deployment of adequate trained staff at all levels of the programme*
- *Re-introduce Malariology as a separate special course as well as a module in medical / nursing education.*
- *Constant monitoring and supportive supervision as well as accreditation of training institutions associated with training of the programme team.*
- *Bringing in a policy of filling up vacancies, focus on high risk areas and rational transfers as well as supportive supervision of health cadres and lab technicians.*

39. *Promoting operations and field research in Malaria Control particularly focussing on socio-epidemiology; an informal research process guiding network; appropriate technology; and an efficient lab to field programme transfer.*

40. *Concerted action to promote epidemic monitoring and or control/prevention at the field level and enhancing the epidemic preparedness at the district level.*

41. *Strong effort to prevent/resist political interference in control programmes as well as corruption/mismanagement at various levels.*

42. *While promoting International Public Health cooperation it is necessary to have a watchdog committee of Government and Volags members to evaluate every bilateral project to ensure that the project is geared to :*

- *enhancing national capacity to deal with the problem.*
- *building national infrastructure especially trained and skilled multidisciplinary manpower.*
- *is rooted in approaches/strategies responding to local needs and socio-economic-cultural-political realities of the country and arising primarily out of local experience*
- *preventing national strategies/projects becoming subservient to the priorities/ needs of international funding agencies, institutions and resource persons whose understanding of local socio-epidemiology is often rather limited and who may inadvertently promote the research, training and programme agendas of their own institutions/agencies rather than being supportive of local expertise.*

- *ensuring that project / linkages are transparent and subject to collective peer group dialogue and interaction among all those who are seriously involved and interested in malaria as a public health problem.*

43. *Review the existing MIS in Malaria and ensure that the whole system is simple, integrated and responsive rather than complicated, compartmentalised and bureaucratic.*

44. *As a new policy alternative seriously establishing the primary/central role of the states in the programme and devolving funds to that level. Also reorienting the central NMEP organisation to provide training and other supportive facility.*

45. *Reviewing all the operational aspects of the programme at all levels and making suitable mid course corrections and management/organisational modifications responsive to the local field realities including the suggestions given by expert groups.*

46. *Finally, we need to ensure that Malaria becomes part of an integrated, people oriented, decentralised, enabling/ empowering Health policy in which the people/community become central to the whole policy framework.*

31b. Complementary role of the Voluntary Agencies

While all these suggestions have been made to NMEP and all those who are keen to do something seriously about the Resurgence of Malaria in the country, we would be failing in our duty if we did not also encourage the development of a complementary response from the voluntary agencies.

We believe that building on the initiatives that VHAI has already taken such as the workshops in Assam and Rajasthan; special issue of Health for the Millions; Rational malaria care - technical working group; and now Malaria expert group, and in close collaboration with CMAI and CHAI (the two other national coordinating organisations of health projects in the voluntary agencies) VHAI should

1. *Promote an active dialogue between the Voluntary agencies and NMEP to identify a special complementary role for the sector in the Malaria Control programme. (The MEG report could be a starting point for dialogue).*

2. *Promote an active dissemination of ideas and experiences and guidelines of NMEP / MRC to the voluntary agencies through publication and CME updates.*

3. *Organise informal meetings of Volag network all over the country but perhaps to begin with focussing on the North East, the States of Gujarat, Maharashtra, Rajasthan, Bihar, Madhya Pradesh, Uttar Pradesh and Orissa and the 15 cities / towns which have been designated as problem areas - to mobilise the voluntary agencies and involve them in malaria control activities.*

4. *While the voluntary agencies members could be involved in all aspects of the programme VHAIs initiative should be focussed on those aspects on which the voluntary agencies has something concrete to offer:*

   i. *Creative health communication strategies*

   ii. *Mobilization/utilization of human resources and groups at community level*

iii. *Dialogue with ISMs and Alternative Systems of Medicines*

iv. *Rational therapeutics and Rational Drug Policy in Malaria*

v. *Community Health oriented training of health staff at all levels*

vi. *Orientation and reorientation of Panchayat leadership.*

vii. *Orientation and involvement of Teachers and children through school based programmes, child to child and other approaches.*

5. ***Finally - while playing a complementary/supplementary role at the field level to enhance the action response of the voluntary agencies, VHAI through its MEG and other resource associates should play an active facilitating and watchdog role to***

   i. ***Enhance socio-political-economic-cultural context analysis in Malaria Policy***

   ii. ***Monitor the Market economy distortions at various levels and evolve counter strategies***

   iii. ***Enhance the role of the voluntary agencies as issue raisers, awareness builders and lobby for a more community oriented empowering malaria strategy integrated with a decentralised, community oriented health policy.***

If the Voluntary Agencies through its efforts can bring back the people/community back to the core of the Malaria strategy as full active participants and not as passive beneficiaries, we would have made a significant contribution to the programme.

Bringing back the community into the Malaria Programme let that be our strategy- let that be our slogan.

We hope this report will start an interactive dialogue leading us to that goal!

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33. PRESENTATION AND REVIEW OF THE REPORT

A meeting was held on March 6, 1997 at VHAI, New Delhi to discuss the Report. The following experts from the government and non-government organisations participated in the meeting.

01 Dr. Ravi Narayan
Coordinator/Secretary
Community Health Cell, Bangalore.

02 Dr. P.N. Sehgal
Consultant, Voluntary Health Association of India
New Delhi.

03 Dr. Mira Shiva
Head, Public Policy Division, VHAI
New Delhi.

04 Prof. Amitabha Nandy
Head, Deptt. of Protozoology, Calcutta School of
Tropical Medicine, Calcutta.

05 Dr. Rajaratnam Abel
Head, RUHSA Department,
RUHSA Campus, Ambedkar Dist., T.N.

06 Dr. Sunil Kaul
AVARD-North East Office,
Jorhat, Assam.

07 Dr. Shiv Lal
Director, National Malaria Eradication Programme
Delhi.

08 Dr. V.P. Sharma
Director, Malaria Research Centre
Delhi.

09 Dr. N.K. Shah
WHO Representative in India
New Delhi.

10 Mr. Ian Pett
First Secretary (Health), British Council Division
New Delhi.

11 Mr. James Valiath, P.R.O.
Catholic Hospital Association of India
New Delhi.

12 Fr. James Culas
Director, Catholic Hospital Association of India
Secunderabad.

13 Dr. P. Jambulingam
Asst. Director, Vector Control Research Centre
Pondicherry.

14 Dr. Shailendra Awale
Christian Medical Association of India
New Delhi.

15 Dr. Manoj Kurian
Christian Medical Association of India
New Delhi.

16 Mr. Sanjoy Sengupta
Programme Officer. VHAI
New Delhi.

17 Mr. S. Ganguly
Voluntary Health Association of India
New Delhi.

Dr. Mira Shiva welcomed the participants. Dr. V.P. Sharma chaired the session.

Dr. Ravi Narayan on behalf of the Malaria Expert Group presented the report. The following aspects from the report were highlighted.

The basic cause of resurgence of Malaria is 'PUBLIC HEALTH CRISIS AND HEALTH CARE SYSTEM RESISTANCE' besides the 'Agent Resistance', 'Vector Resistance' and 'Technical Problems and Limitations'.

The lessons learnt from the history of Malaria Control are:(i) Potential for sustained public health action; (ii) Competence in a diversity of approaches; (iii) Synergy between political and 'health' leadership; (iv) Local solution in response to local realities and constraints; (v) Recognising economic advantage of National Health Programmes and (vi) Recognising and monitoring significant factors responsible for resurgence of Malaria such as migration and development activities that increase malariogenic potential.

The current needs are for a SOCIO-EPIDEMIOLOGY approach i.e. a shift from TECHNO-MANAGERIAL problem analyses and assessment to a study of Socio-Cultural-Economic-Political-Behavioural issues relevant to the community at risk. The study of the community at risk and the societal context is important beside the Agent, Vector and Environment The examples are (i) KAP Studies; (ii) Economic Analysis; (iii) Socio-Anthropoligical Studies; (iv) Operations Research and (v) Community Based Action Research.

While promoting rational Malaria Control, there is urgent need for : (i) Enhancing/strengthening laboratory diagnosis, skills and services (i.e. emphasis should be from 'Fever' programme to 'Malaria' programme); (ii) Re-establishing clinical diagnosis skills i.e. diagnosing Malaria by excluding other causes and diagnosing complications of Malaria; (iii) Promoting Rational Drug Policy for Malaria i.e. rational standard regimens; treatment of falciparum malaria resistant to chloroquine and restricting the availability and use of Mefloquin; (iv) Promoting Personal Protection through multiple alternatives and preventing over emphasis of treated 'BED NETS'.

The main emphasis of the complementary strategies rediscovering the 'Community' in Malaria Control by:(i) Enhancing community participation and capacity in Malaria Control by using Primary Health care approach; (ii) Active involvement of : Panchayats, local community organisations such

as mahila mandals, youth clubs, schools, farmers cooperatives, voluntary sector projects, private practitioners and Indigenous Systems of Medicines including folk health traditions; (iii) Enhancing Health Education and Awareness building through folk and local media, school based programmes and creative, interactive - culture sensitive approaches.

Symultaneously there is an urgent need to counter the Public Health system crisis in the country by: (i) Tackling 'Human power' shortages effectively; (ii) Developing 'Public Health' skills and competence among Health Policy and Health care decision makers; (iii) Countering corruption and political interference in policy decision making; (iv) Countering the 'Market Economy' in international Public Health Collaboration; and (v) Controlling 'Man-made Malaria' i.e. Development Malaria.

Equally important and ... of the effort is the exploring new challenges in Research and Action through:(i) Improvement of Management Information System and Epidemiological Monitoring to tackle problems of under-reporting/underestimation; (ii) Re-establishing Bio-Environmental Control and other Eco-sensitive approaches; (iii) Study/Assessment of Indigenous System of Medicine's and Local Herbal Practices for Malaria care; (iv) Enhancing Decentralised Planning and Action Capacity and (v) Development of Environmental Impact Assessment of 'Man-made Malaria'.

Complimentory role for the Voluntary Sector in (i) Preparation of Action Plans in collaboration with NMEP and MRC at state level; (ii) Involvement in Malaria Control at community level; and (iii) Facilitating and advocacy role, was emphasised.

Dr. Shiv Lal, Director, NMEP, while broadly agreeing to the Report, mentioned (i) Spraying by NGOs could be permitted with adequate training for spraying and fulfilling the required criteria for spraying in areas where spraying was required as part of malaria control and where their efforts would facilitate malaria control; (ii) BHC would be banned from April 1997, however use of DDT wherever indicated could be allowed, synthetic pyrethroids were extremely costly and would be kept as last resort; (iii) It would be more important to prepare ourselves to prevent and control epidemics and to learn to respond to them timely and effectively and not just do fire-fighting; (iv) The budget for IEC was being increased; (v) NMEP was not quite recommending 'Ayush 64' a drug from TSM since the parasite clearance rate was 50% only; (vi) The role of social sciences in NMEP has been recognised and two posts of IEC in NMEP had been given to social scientists; (vii) Anti-Malaria Month was being planned in June with preparations already started from January '97; (viii) One hundred highly endemic districts in seven States had been identified for intense work; (ix) NMEP had to find out how to smoothen the flow of funds to District Committees. Guidelines had been issued for setting up District Committees and that no funds would be issued without district plans; (x) The State plans would emphasize on Training, MIS and IEC.

During the discussions the following points emerged:

While resistance of P.falciparum to chloroquine was being studied by NMEP but the information collected by NMEP was not disseminated to those involved in the clinical management of malaria patients. The revised treatment schedule of malaria was not available to a large number of PHCs and to the voluntary and private sector treating malaria cases.

There is need to take stock and analyse the existing anti-malaria drug market since large number of drugs like Mefloquin are being brought under the (OGL) open general license. No one has any idea how much of the Mefloquine is being imported and how it is being used. There is need to study drug utilization patterns, drug prescription and drug consumption patterns, with warnings about drugs not recommended during pregnancy. In many countries, the drug manufacturers are responsible for conducting post marketing surveillance of drugs recently launched. The drugs like Mefloquin meant to be used restrictedly for falciparum malaria resistance to chloroquine, must be actually restricted. Since irrational use of these drugs would result in these drugs being 'lost', as drug resistance was found to emerge making these ineffective.

There was urgent need for incorporating of Rational Malaria Care in Medical Education, in continuing

medical education and pharmacy training.

There is need for standardization of lab. technicians course as in the recent years, large number of private lab. technicians courses have started, which are not providing adequate training.

The need for simple diagnostic test was discussed. The dipstick test is positive if there is malaria, as the antigen is the break up product of malaria parasite. Disadvantage is that (i) it cannot differentiate between P.falciparum and P.vivax, (ii) it remains positives for 4-5 days even after adequate treatment and therefore may misguide. **The best diagnostic test is still good clinical history, physical examination showing clinical features of malaria, corroborated with thick blood smear microscopic examination**.

Regarding the use of impregnated bed nets (IBN), there is a need for safety study for toxicity. IBN cannot give full protection as mosquitoes can still bite at other times when person is not inside the IBN. There is need to study socio-cultural behaviour aspects between use of IBN and ordinary bed net.

The paucity of entomological information was highlighted. Most of the posts of entomologists remain vacant and they don't have full infrastructure including transport for field studies. The entomological studies need to be strengthened at all levels.

The NGOs should be actively involved at State, District and Block levels. The government should provide technical and material support, for which criteria may be laid down.

The meeting ended with a broad consensus of agreement on the 'Appropriate Malaria Control Strategies' covered in the Report and emphasised closer collaboration and networking between the govenrment, voluntary, private and corporate sectors.

(pr/meg1/07041997)

APPENDIX

APPENDIX - A

Regional Diversity of Malaria Situation

Statewise distribution of Malaria

As per NMEP reports statewise epidemiological data of Malaria cases, P.falciparum cases and deaths during 1991 - 1995 are as follows:

States showing increasing trend of Malaria:

Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Goa, Haryana, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Manipur, Mizoram, Rajasthan, West Bengal, Dadra & Nagar Haveli, Daman & Diu and Pondicherry.

States showing increasing trend of P.falciparum:

Arunchal Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Manipur, Mizoram, Rajasthan, Chandigarh, West Bengal, Dadra and Nagar Haveli and Daman & Diu.

States showing decreasing trend of malaria incidence :

Gujarat, Himachal Pradesh, Orissa, Punjab, Tamil Nadu, Uttar Pradesh, Andaman & Nicobar Islands, Chandigarh and Pondicherry.

States showing decreasing trend of P.falciparum malaria :

Andhra Pradesh, Goa, Tamil Nadu, Uttar Pradesh and Pondicherry.

Other states are either having static or marginal fluctuating epidemiological situation.

Outbreaks of Malaria:

Malaria outbreaks were reported in the States of Manipur (48 deaths), West Bengal (3 deaths), Andhra Pradesh (173 deaths), Nagaland (253 deaths) and Rajasthan (452 deaths) during 1994.

In the year 1995 also the States of Assam, West Bengal and Maharashtra experienced malaria outbreaks in a number of districts with high morbidity and reports of death (NMEP Directorate).

Source: Sehgal, P.N., VHAI - New Delhi.

[Note : While Orissa has been shown in States showing decreasing trends many NGO's have reported that the situation in the State is seeing an increase in Malaria and an increase in pf cases (!).]

APPENDIX - B

Malaria Problem Areas

Malaria is endemic in India and active transmission has been reported from almost all areas except those above 2000 msl and the coastal belts on western ghats. Some areas have very low receptivity like the State of Kerala and North Bihar. Malaria in India is largely unstable and therefore comes in waves after an interval of several years depending on immunological, environmental and meteorological factors. The problem areas are broadly classified as under:

Hard-Core Areas (Tribal areas)

Those areas where malaria control operations over the last four decades have failed to contain the disease. Such areas have the following characteristics:

1. These are mostly difficult terrain areas, and a large part of which becomes inaccessible during monsoon and subsequent flooding
2. The population is predominantly tribal.
3. They have predominantly P.falciparum infections.
4. They have stable malaria with transmission extending to 9 months or more.
5. They report bulk of malaria deaths in the country.

These areas comprise of (a) Seven North-Eastern states ; (b) Tribal areas of 87 districts in the States of Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Orissa and Rajasthan.

Epidemic Prone Areas

High risk areas are considered to be those which are often prone to malaria epidemics. The periodic fulminating malaria epidemics contribute a large number of malaria deaths. North western plains, semi arid climatic zone with annual rainfall upto 100 mm and Indo-Gangetic plains are identified as major epidemic prone areas. During epidemics the malaria deaths in these high risk areas outnumber the malaria deaths reported from the rest of affected States.

Project Areas

The developmental projects attract a large number of labour population from endemic areas bringing different strains of malaria parasites as well as non-immune populatioin groups. The prolific increase in vector breeding places and increased man-mosquito contract favour high malaria transmissions. These pockets contribute a large number of malaria cases which are highly disproportionate to the relatively small population group inhabiting these areas. Specific control strategy is required for such areas.

Triple Insecticide Resistance Areas

The ubiquitous rural vector, Anopheles culcifacies has become resistant to the conventioinal insecticides namely, DDT, BHC and Malathion in the western belt of India, specially the northern parts of Maharashtra and Karnataka and southern parts of Gujarat. In addition there are such pockets of insecticide resistance in other parts of the country.

Fortunately, only a few pockets in the above triple resistant belt exhibit high risk to malaria. In such identified high risk areas, indoor residual spray with synthetic pyrethroids is considered to be better alternative tool to contain/ prevent malaria epidemics.

Urban areas

The review of past data of urban malaria scheme reveals that the following 15 cities accountable for nearly 80% of malaria cases of Urban Malaria Scheme (UMS) of NMEP. For example Madras City alone is responsible for nearly half the malaria cases in Tamil Nadu (NMEP Directorate).

These cities are :

01. Delhi	02. Madras	03. Calcutta	04. Mumbai (including New Bombay)	05. Hyderabad
06. Bangalore	07. Bhopal	08. Ahmedabad	09. Jaipur	10. Lucknow
11. Chandigarh	12. Vadodara	13. Visakhapatnam	14. Vijayawada	15. Kanpur

- Sehgal, P.N., VHAI, New Delhi.

APPENDIX - C

Stains for Lab Diagnosis - Alternatives

Comparative Features of Stains for Malaria Parasites.

Features	Leishman	Giemsa
Prior fixation in methanol	Not necessary	Necessary
Dehaemoglobinisation of the thick smear	Necessary	May not be, better to do it.
Colour of cytoplasm	Faint blue	Deep blue
Colour of nucleus	Faint red	Bright red
Stiplings	Seen	Better seen
Easeness of identification of parasites	Inferior	Easy
Time of staining	By and large same in both	
Cost	Less	More
Longivity of stained smear	Less	More

Preparation of Stains

Although currently both these above mentioned stains are commercially available in "ready to use" form, it is always better to standardise and prepare them for their use in the respective laboratories. However, for the purpose of learning the following are the methods.

Leishman stain :

Leishman power (BDH/E.merk)..... 150 mg
Methanol, acetone free, for stain..... 100 ml

Rinse out a clean bottle with methanol. Using a pastel and morter mix the stain powder in the methanol and strain it through a Whatmen No.1 filter paper in to the bottle, leave the bottle at 37 C for 5-7 days for maturation and then it is ready for use.

Giemsa stain

Giemsa power	750 mg
Methanol (acetone free)	65 ml
Glycerol	35 ml

Put the ingredients in a bottle containing glass beads and shake. Shake the bottle 3 times a day, 5-10 minutes each, for 4 consecutive days. Filter and store which is now ready for use.

Buffered water for Giemsa or Leishman stain

Di-sodium hydrogen phosphate ($Na_2HPO_4, 2H_2O$) ..... 3.76 Gm
Potassium di-hydrogen phosphate (KH_2PO_4) ..... 2.1 Gm
Distilled water.....1000 ml

Check the pH and maintain it at 7.0 - 7.2

- Nandi, Amitabha,
Calcutta School of Tropical Medicine, Calcutta

APPENDIX - D

MALARIA POLICY IN THE CONTEXT OF DRUG POLICY AND HEALTH POLICY

-Notes on Production, pricing, Availability

Some reflections

- The production and price of anti-malarial drugs just like all other drugs is basically decided by the Chemicals Ministry under the Industry Ministry.

- The Drug Policy has no clause to enforce production of essential and life saving drugs, rather than the more profitable non essential drugs. The absence of production controls is reflected in shortage of certain essential and life saving drugs from time to time. So far shortage of anti malarial drugs have not been reported, but non availability of these drugs due to non streamlined drug distribution has been a problem in some areas. Most of the deaths due to Malaria that have occurred have been associated with poor health services and non availability of timely and proper treatment.

- A rational drug policy is expected to ensure the following drug situation specially in relation to anti malaria drugs i.e., adequate production, distribution and therefore

  - availability
  - quality control
  - reasonable cost
  - adequate drug information - specially warning
  - clear comprehensive therapeutic guidelines
  - adequate information about individual drugs

- Availability of anti malaria drugs depends on production. Many manufacturers are known to utilize only a part of their installed capacity.

While some of the anti malarial drugs are available in the market at a cost, some of the drugs eg., Primaquin are available only/mainly through the government's health infrastructure. How much this interferes with ensuring prescription and compliance in taking radical treatment quantitatively and qualitatively is not known but it is suspected to be significant. The brands in the market are of chloroquin, amodiaquin, sulfadoxine, pyrimethamine, quinine, proguanil and primaquin.

Availability of anti malarials in different dosage content wise could lead to confusion. There is a need to standardise the content and recommended dosage.

Quality Control

There have been reports of non response to anti malaria drugs, by the patients on consuming the recommended anti malarials. Some of this may be due to:

1. poor compliance in taking anti malarial drugs i.e., not taking
2. vomiting out of drugs specially chloroquin after taking it on an empty stomach or due to associated severe nausea
3. emergence of drug resistance
4. substandard spurious anti malarial drugs.

This needs to be carefully assessed.

- From time to time large number of drugs in the government health infrastructure have been found to be substandard. Since the method of drug purchase in public institutions is through eliciting tenders, with the drugs being purchased from those giving the lowest tender, sometimes even below the cost price, several cases of substandard and spurious drugs have come to light. Specific quality control of drugs for the National Health Programme needs to be undertaken, specially so for drugs prescribed for communicable diseases. There should be ensuring of quality control from the point of manufacture to the point of retail and distribution.

- Since drugs once supplied to the periphery are rarely thrown out even after the expiry date, when assessing availability of anti malarial drugs, it must be done so with exclusion of expired drugs, and substandard drugs.

- Purchase policies of antimalarial drugs need to be reviewed keeping the
  - seasonality of the disease in mind,
  - time log in budget allocation,

- indenting of quantities required in the periphery to purchase and distribution time to the periphery where the Malaria patients are.

Drug Price

There has been an increase in drug prices of most branded anti malarials. One was due to the antimalaria drugs being put outside the price control with the DPCO 1986 and 1994. Even though the content is the same, prices of different brands differs eg., chloroquin. This need to be looked into.

Drug Information

MIMS which acts as the Prescription guide for most doctors includes pregnancy as a special precaution for chloroquin brands including Emquin (Merc), Lariago (IPCA), Cloket (Indoco), Cloquin (Indoco), Resochin (Bayer), Stadmed (Laquin). The dosage for chloroquin are 600 mg. as well as 500 mg. The recent NMEP guidelines have not affected the drug information being provided by commercial guides.

The contraindication information of Primaquin brand PMQ, INGA by INGA does not include pregnancy and infants (MIMS, May 1996).

Therapeutic Regimen for treatment of Malaria as recommended by Social Preventive Medicine Text book - Park and Park; Harrison Text Book of Medicine; Davidson's Text Book of Medicine; Goodman Gilman Pharmacology Text Book; and in the commercial guides eg., MIMS, CIMS and Drug Today, are very different from the recommendations of NMEP in the Operation Manual. There is a need for standardized Therapeutic Guidelines. Systematic diagnostic procedure should be followed to ensure

1. proper treatment of malaria patients
2. control and prevention of spread of malaria
3. prevention of emergence of drug resistance to antimalarials due to irrational or misuse of anti malarials.

- To encourage following of the therapeutic guidelines, Prescription Audits, medical Audits, have to be undertaken to assess and rectify irrational prescription practices. There is also a need to undertake studies on drug consumption practices, and trends in self management of malaria.

Drug Policy Related Issues

In 1978, the Drug Policy identified an essential drug list of 116 drugs in which antimalarials (Chloroquin) was included.

In 1979, The Drug Price Control Order attempted to control the prices of essential drugs by permitting a lower mark up on it as compared to less essential drugs. Around 343 drugs were brought under Price Control. With 40% mark up for category I, 55% in Category II and 75% in Category III. The unfortunate consequence of this inverse drug pricing was decreased production of essential drugs and proliferation of non essential drugs.

In 1984, the NDPDC, National Drugs and Pharmaceutical Development Council was formed to revise the Drug Policy. The production of anti-malarial drugs was treated as follows:

Regarding the setting up of Estimated Targets the criteria used was totally irrational.

Setting Demand Targets

The criteria used by the NDPDC demands is based mainly on inaccurate drug production figures and past distorted growth trends rather than on present assessment of health problems and drug needs.

The Drug Policy has based its drug production targets more on market demands than on health needs.

Categorisation of a drug as an Essential life saving drug and recognition of it being needed for a national control program means nothing in terms of drug production and availability in the present situation.

Asking for 20% Essential drug production without creating the machinery for ensuring its production will mean nothing. The estimates of drug requirements must keep in mind the health needs, service targets and health demands.

In absence of estimates based on epidemiological data, morbidity and mortality figures which needed to be provided by the Health Ministry - based on effective information systems - the estimates were fixed by the Chemicals Ministry. Inspite of Targets being fixed, it was not essential for these targets to guide the production figures.

In 1986, the new Drug Policy "Rationalisation Measures for the Growth of the Drug Industry" was formulated. This resulted in further increase in the drug prices. Several anti malarial drugs were brought outside the price control basket.

The Bulk formulation ratio meant to encourage bulk drug production and not just formulation was made more lax. There was further decontrol, liberalisation, globalisation and import liberalisation.

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APPENDIX - E

A Catechism on Malaria

Prof. A Nandy, Incharge, Department of Protozoology and Dr. S.K. Guha, RMO, Department of Tropical Medicine, Calcutta School of Tropical Medicine, Calcutta 700 073

Q.1. Which form of the parasite is responsible for clinical attack?

Ans. Clinical attacks of malaria are caused by the asexual blood stages of the parasite only.

Q.2. Are all types of malaria prone to relapse?

Ans. Relapse (precipitation of clinical attacks due to reactivation of hypnozites in the liver) is a feature of vivax malaria and recrudescence (i.e. recurrence of clinical attacks due to persistence of the asexual forms of the parasite in blood stream) that of falciparum.

Q.3. Is there any means to distinguish clinically or parasitologically between relapse and reinfection?

Ans. There are no ways to distinguish relapsed malaria from a fresh attack due to re-infection, either clinically or parasitologically.

Q.4. Has P. vivax developed resistance to chloroquine in India?

Ans. There is no report of chloroquine resistant vivax malaria from anywhere in the country.

Q.5. Is it possible to recognise resistant malaria clinically? If not, then how can it be diagnosed?

Ans. Drug resistance has been described as the ability of a parasite strain to survive and/or multiply despite the administration and absorption of a drug on doses equal to or higher than those usually recommended, but within the limits of tolerance of the subject.

Clinically three degrees of resistance are encountered:

R_I Clearance of asexual parasitaemia within 7 days of beginning treatment with chloroquine. But there is recrudescence (i.e. reappearance of fever within 28 days of beginning of treatment).

R_{II} After full dose of chloroquine, parasitaemia decreases to 25% or less of the pretreatment level but never completely disappears from peripheral blood (marked reduction in asexual parasitaemia, but no clearance).

R_{III} Little or no fall in asexual parasitaemia even after the administration of chloroquine in full doses (no marked reduction in asexual parasitaemia).

Parasites of falciparum have developed resistance to many antimalarial drugs of which most important in chloroquine.

Clinically it is rather difficult to diagnose resistant malaria in most cases. However, a history of contracting malaria in an area known for resistant falciparum malaria cases and persistence of fever ever after 3 days of completion standard treatment schedule of chloroquine provided vomiting and other causes of malabsorption of the drugs as excluded and other causes of fever have been ruled out should arise suspicion but for definite evidence of resistance, it is essential to examine thick blood smear (atleast 200 fields) daily for seven days and then on day 14, 21 and 28 after administration of the drug.

In vitro drug sensitivity testing kit has been developed and distributed by WHO. In this test, patient's blood in incubated in graded dilution of the drug for 48 hours after which the effect is assessed by noting the decrease in the number of asexual stages of the parasite compared to the number of the same, present in the initial sample before incubation. The kit is available with the National Malaria Eradication Programme (NMEP) centres.

Q.6. What is the significance of gametocytes in the peripheral blood smears?

Ans. Gametocytes do not cause clinical attacks but as responsible for transmission of malaria.

Q.7. Is it mandatory to examine blood film at the heights of temperature?

Ans. Peripheral blood smears from suspected malaria patients can be collected at any time of the day and night and not necessarily at the height of tremperature. It is often very difficult to recognise malaria parasites in the blood smears collected at the height of fever because of their smaller size and thus leading to missed diagnosis.

Q.8. Is it true that malaria parasites cannot be demonstrated if chloroquine has been already administered?

Ans. Previous treatment with ineffective doses of chloroquine not only reduces the chance of detection of parasite in the peripheral blood smears but also puts the patient towards the grave sequelae of complicated malaria (see below) and emergence of chloroquine-resistance particularly in falciparum malaria. Even in the chloroquin sensitive strains, after full doses of the drug, parasites may be detected in the peripheral blood upto 96 hours, although in decreasing number. However, gametocytes of P.falciparum, because of their insensitivity, will continue to persist in the blood until their natural death.

Q.9. What is the specificity and sensitivity of ELISA in the diagnosis of malaria? When should it be advised? Is it cost effective?

Ans. Because of the persistence of antibodies after previous attack and because it fails to discriminate between past and present infections ELISA test has got limited value in the diagnosis of individual cases but can be used as an epidemiological tool to estimate the prevalance of the disease not only in a particular area but also in different age groups. Serological methods in malaria are also useful in the assessment of annual incidence, changes in the transmission pattern and mapping out malaria foci in a country. However, the cost of ELISA test is much more than that of conventional blood film examination.

Q.10. Is it necessary to examine thick blood film?

Ans. Being a concentration method parasites can be easily detected in the thick smear even in a situation of very low parasitaemia taking much less time and therefore it is more useful in laboratories dealing with a large number of blood slides, particularly the malaria detection centres under NMEP. Besides, thick film examination remains the only choice to assess parasite load following chemotherapy leading to declining parasite count.

Q.11. What is the significance of thin blood film examination?

Ans. Excepting few morphological forms, e.g. crescents and early ring forms of P. falciparum, differentiation of various species (P. vivax, P. falciparum etc) in most cases cannot be done by thick smear examination because of the deformities caused to the parasites during the process of dehaemoglobinisation. In contrast, the morphological integrity of the parasites is preserved in the thin smear leading to correct identification of the species.

Q.12. What is the rationality of giving chloroquine phosphate tablets 250mg (containing 150mg of chloroquine base) 4 tablets immediately followed by 2 tablets after 6 hours and then 2 tablets at a time daily for 2 days? (Does it really make any difference in chloroquine is given as one tablet twice/thrice daily upto a total 10 tablets or more; or 2 tablets TDS x 4 days and the like?)

Ans. After absorption from the g.i. tract, chloroquine gets deposited extensively in tissues like the liver, spleen, kidneys, lungs, melanin containing tissues and to a lesser extent, in the brain and spinal cord. Because of this extensive tissue - binding (deposition), administration of loading dose of chloroquine is required to achieve a parasiticidal concentration in the blood. A dose of 10 mg of base/kg of body weight followed by another dose of 5mg/kg after 6 hours and two similar doses of 5mg/kg at 24 and 48 hourse after initiation of therapy has been found to be the most effective schedule. The only other suitable and effective regimen is as follows :

1st dose	10mg/kg	
2nd dose	10mg/kg after	24 hours
3rd dose	5mg/kg after	48 hours.

With all other dosage schedules, defervesence (achievement of afebrile state) and parasite clearance time are prolonged (may also give rise to recrudescence) and the chances of the parasites developing resistance to chloroquine are increased. Hence, should not be advised.

Q.13. When should pyrimethaime + sulphadoxine/sulphalene combinations (eg., METAKELFIN, FANSIDAR, CROYODOXIN etc.) be used? Can it be combined with chloroquine?

Ans. This fixed dose combination drug has been licensed for treatment of resistant falciparum malaria only. Unfortunately, the prescribers have been kept ignorant of this fact and as a result it is being misused for all cases of malaria, even in cases of fever with presumptive diagnosis of malaria.

This drug is no longer recommended for chemoprophylaxis of malaria because of its severe toxic potential. It can produce erythema multiforme, Stevens-Johnson syndrome, toxic epidermal necrolysis, serum sickness like manifestations, exfoliative dermatitis, hepatitis, etc. This fixed dose combination is recommended only to treat resistant falciparum malaria. P. vivax is intrinsically relatively insensitive to sulphonamide component and rapidly develops resistance to pyrimethamine; therefore resistance to this combination is very common in vivax malaria. Hence, not recommended to treat vivax malaria. Moreover, it should not be coadministered with chloroquine.

Q.14. What is the indication and dosage of quinine in malaria?

Ans. In malaria, quinine is indicated in the treatment of multiresistant falciparum malaria; and severe and complicated malaria. See treatment of severe and complicated malaria for dosage and other details - below.

Q.15. When should primaquine be prescribed? Can it be used during pregnancy, in infants and children? Can it be used with chloroquine/pyrimethamine + sulphadoxine combinations?

Ans. ***Primaquine in falciparum malaria :***

As a gametocytocide it should be used in combination with a blood schizontocide in P. falciparum infection in areas where it is important to reduce the chances of transmission, since following its administration the patient is no longer infective to mosquitoes. This kind of treatment may be necessary in areas of seasonal infection, during epidemic, and to prevent re-establishment of infection in areas from where it was previously eliminated. In all these cases chemotherapy is usually combined with vector control measures. Administration of primaquine in falciparum malaria does not benefit the patient but the community. It only kills the gametocytes which would otherwise be eliminated normally after the life-span of RBC containing the gametocytes in about 120 days time.

Time of administration - single dose after completion of the course of chloroquine.

Dose as gametocytocidal

<1 year 1	nil;	2-4 years -	7.5mg
5-8 years -	15 mg	9-14 years -	30mg
adults -	45mg		

Primaquine in vivax malaria

Primaquine because of its hypnozoiticidal activity in case of P. vivax and P. ovale is used after chloroquine for radical cure. Such use is indicated only in areas free of malaria or with very low endemicity. By and large in India, most of the areas have become moderate to highly endemic, radical treatment, particularly the use of primaquine is not warrented. Under rare situations, considering merit of individual cases. eg. person having repeated and frequent clinical attacks of malaria (relapse), primaquine may be used for 2 weeks preferably after estimating blood Glucose 6 phosphate Dehydrogenase (G-6PD) enzyme level.

Dose for radical cure

15mg of primaquine base daily for 14 days; if G-6PD deficiency is known or suspected, 0.75mg (base)/kg weekly for 8 weeks.

Primaquine should be used following full doses of a 4-aminoquinoline schizontocide preferably chloroquine.

Haemolytic action of primaquine is related to G-6PD deficiency. Hence, primaquine should always be avoided in pregnancy (since foetuses are relatively G-6PD deficient.) and infancy (<1 year of age). Some paediatricians prefer to use it beyond 3rd year of age.

Q.16. What is the role of chemoprophylaxis in malaria

Ans. Before advising chemoprophylaxis, two important decisions are to be taken: (i) whether to advise it and (ii) which is the appropriate drug. It is irrational, if not dangerous to advise chemoprophylaxis for person permanently living in the endemic areas for obvious reasons. It is indicated usually in two categories of individuals(a) persons coming from non-endemic countries (b) pregnant women in endemic areas.

Weekly chloroquine therapy for people living permanently in endemic region is not only useless but dangerous also because of cumulative toxicity of chloroquine (retinal damage) and low parasite density resulting in missed diagnosis leading to fatal outcome. Moreover, chloroquine prophylaxis does not protect an individual from acquiring the infection and the disease, but can only keep the mortality rate low.

However, in situation where it is indicated, chloroquine 5mg/kg once a week is to be advised.

Fixed dose combinations of pyrimethamine + sulfadoxide should never be used as a chemoprophylactic agent. However, persons going to areas known to be endemic or hyperendemic for chloroquine resistant P. falciparum should carry the drug and in case of fever and/or parasitaemia only, can take the drug pending arrival of qualified medical help.

Q.17. Does norfloxacin really have antimalarial action

Ans. Quinolones (ciprofloxacin, norfloxacin, etc) have been found to possess inhibitory action on Plasmodium (responsible for malaria) but reports of properly conducted clinical trials or textbook recommendations for use

in malaria are not available.

Q.18. What is the drug of choice in complicated malaria?

Ans. Out of all the drugs chloroquine still remains the drug of choice for any type of treatment for any kind malaria except in resistant cases and unconscious patients (See below for details.)

Q.19. Is it mandatory to start treatment of malaria on after blood film examination?

Ans. Ideally all malaria cases should be treated only after parasitological confirmation of the species. In situations where such investigation is not possible a presumptive treatment may be advised following collection of peripheral blood smears.

**** Table 1 : Antimalarial chemotherapy of severe falciparum malaria in adults and children**

Chloroquine-sensitive malaria	*Chloroquine-resistant malaria or sensitivity not known*
Chloroquine, 10mg base/kg of body weight in isotonic fluid by constant-rate intravenous infusion over 8 hours, followed by 15mg/kg of body weight given over the next 24 hours.	Quinine dihydrochloride 20mg salt/kg of body weight (loading dose)[a] by infusion over 4 hours, in 5% dextrose saline (5-10 ml/kg of body weight depending on the patient's overall fluid balance).
or	Eight to twelve hours after the start of the loading dose, give a maintenance dose of quinine 10mg salt/kg of body weight in dextrose saline diluted as above over 4 hours. This maintenance dose should be repeated every 8-12 hours calculated from the beginning of the previous infusion until the patient can take oral medication[b] (e.g. 08h00, 16h00, 24h00).
Chloroquine 5mg base/kg of body weight in isotonic fluid of constant-rate intravenous infusion over 6 hours. Repeat every 6 hours, calculated from the beginning of the previous infusion (continuous administration) for a total of 5 doses	or
or	Quinidine gluconatee 15mg base/kg of body weight (loading dose) by intravenous infusion over 4 hours, then 7.5 mg/kg of body weight over 4 hours; repeat every 8 hours until patient can take oral medication.
(If intravenous infusion is not possible) chloroquine 3.5 mg base/kg of body weight every 6 hourse intramuscularly or subcutaneously[d].	

a. As an alternative, if an infusion pump is available a loading dose of quinine dihydrochloride, 7mg salt/kg of body weight can be given intravenously over 30 minutes followed immediately by the maintenance dose of 10mg salt/kg of body weight.

b. The choice of oral medication will be governed by drug availability and sensitivity of the parasites. The following may be used :

   * quinine tablets, 10mg/kg of body weight, every 8 hours, to complete 7 days of treatment or a single dose of sulfadoxine/pyrimethamine (Fansidar) following a shorter course of quinine.
   * Sulfadoxine/pyrimethamine (Fansidar) or sulfalene/pyrimethamine (Metakelfin) as a single oral dose; sulfadoxine/sulfalene, 25mg/kg of body weight; pyrimethamine, 1.25mg/kg of body weight. These drug combinations should preferably not be given to pregnant women.
   * mefloquine, 15mg/kg of body weight up to a maximum of 1000mg, in two doses 12 hours apart. Mefloquine should not be administered until 12 hours have elapsed after the completion of parenteral quinine administration. This drug should not be given to women in the first trimester of pregnancy.

     halofantrine, 8mg base/kg of body weight every 6 hours for 3 doses. This drug should not be given to pregnant women.

c. Quinidine should be used only if parenteral quinine is not available.

d. Total dose 25 mg base/kg of body weight; change to oral therapy when patient can swallow.

Some important points to note in relation to Table 1

1. In areas with a significant degree of quinine resistance (e.g. Cambodia, Thailand, Viet Nam), add an oral course of tetracycline 250mg four times a day for 7 days, as soon as th patient can swallow. It is unnecessay

** Table 1and information following the Table have been reproduced, by permission from : Gilles, H.M. Management, severe and complicated malaria : A practical handbook, Geneva, WhO, 1991.

and dangerous to give tetracycline intravenously. Tetracycline is contraindicated for children under 8 years and pregnant women. As an alternative, mefloquine could be given as indicated in footnote b to table 1

2. In patients requiring more than 48 hours of parenteral therapy, reduce the quinine or quinidine maintenance dose by one-third to one-half (i.e. 5-7 mg salt/kg of body weight every 8 hours).

3. Total daily doses of intravenous quinine are as follows: day 0 (first day of treatment) : 30-40 mg/kg of body weight

   day 1:30 mg/kg of body weight.
   day 2 and subsequent days : 15mg/kg of body weight.

   It is unusual to have to continue intravenous infusions of quinine for more than 4-5 days. If it is more convenient, quinine may be given by continuous infusion. (infusion rates should not exceed 5mg per kg of body weight per hr).

4. A loading dose should not be used if the patient received quinine or quinidine within the preceding 24 hours, or mefloquine within the preceding 7 days.

5. If for some reasons quinine cannot be administered by infusion, quinine dihydrochloride can be given in the same dosage by intramuscular injection in the anterior thigh. The dose of quinine should be divided between two sites - half the dose in each anterior thigh. If possible, for intramuscular use, quinine should be diluted in normal saline to a concentration of 60mg/kg.

Summary of the management of severe and complicated falciparum Malaria

Manifestation/complication		*Immediate Management*[a]
1. Coma (cerebral malaria)	:	Maintain airway; nurse on side; exclude other treatable causes of coma (eg. hypoglycaemia, bacterial meningoencephalitis). Give prophylactic anticonvulsant (10mg of phenobarbital sodium per kg of body weight intramuscularly). Avoid harmful adjuvant treatments such as corticosteroids, heparin and epinephrine (adrenaline).
2. Convulsions	:	(Prevent with intramuscular phenobarbital sodium, see above). Maintain airway; treat with diazepam given intravenously or per rectum (0.15mg/kg to a maximum of 10mg or intramuscular paraldehyde injection (0.1ml/kg from a glass syringe).
3. Severe anaemia	:	Transfuse fresh whole blood or packed cells.
4. Acute renal failure	:	Exclude dehydration; maintain strict fluid balance; carry out peritoneal dialysis (or haemodialysis if available).
5. Hypoglycaemia	:	Measures blood glucose, give 50% glucose injection 50ml (1ml/kg for children) followed by 5% or 10% glucose infusion.
6. Metabolic acidosis	:	Exclude or treat hypoglycaemia, hypovolaemia and Gram negative septicaemia. Give oxygen. Correct arterial pH to 7.2 or above.
7. Acute pulmonary oedema	:	Prevent by avoiding excessive rehydration. Prop patient up; give oxygen. If the pulmonary oedema is due to overhydration, stop intravenous fluids, give diuretic (furosemide 40mg intravenously) and withdraw 250 ml of blood by venesection into a donor bag.
8. Shock, algid malaira	:	Suspect Gram-negative septicaemia; take blood samples for culture. Give parenteral antimicrobials; correct haemodynamic disturbances.
9. Spontaneous bleeding and coagulopathy	:	Transfuse fresh whole blood or clotting factors; give vitamin K injection.
10. Hyperpyrexia	:	Use tepid sponging and fanning; give antipyretic (paracetamol 15mg/kg of body weight).
11. Hyperparasitaemia	:	Give initial dose of parenteral antimalaria therapy. If parasitaemia in a severely ill patient exceeds 10% carry out exchange or partial exchange transfusion.
12. Malarial haemoglobinuria	:	Continue antimalarial treatment; transfuse fresh blood to maintain haematocrit above 20%; give furosemide 20mg intravenously.
13. Aspiration pneumonia	:	Give parenteral antimicrobials; change position of patient; give physiotherapy; give oxygen.

a - In all cases infusion of an appropriate antimalarial drug should be started immediately.

APPENDIX - F

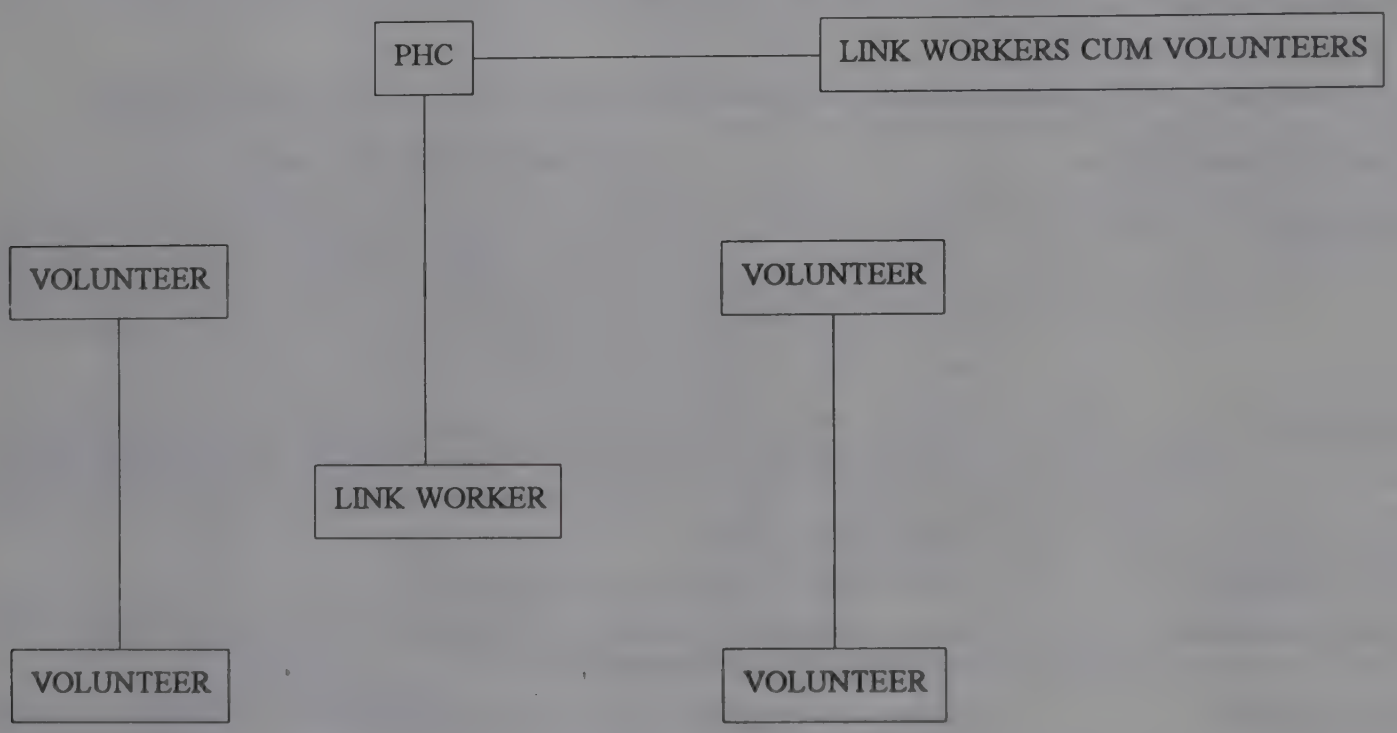
Voluntary Malaria Link Worker

This concept has been touched upon earlier in relation to community capacity building. However, it is important to understand that concept behind this worker. This worker has the roles of two persons shown as one. It may be a community volunteer or a link worker. In some situations the functions may be incorporated into one person. The main issues relating to these workers are give below.

Selection

As far as possible the community should be involved in selecting such a person. This is clear if it is a community volunteer. If it is a link worker then the PHC/Volag may also have to be involved.

Relationships



In some situations where habitations are small a link worker may not be appropriate. In such communities there might be a volunteer. A number of volunteers may be supported by a Link worker on a regular basis.

Role and functions

The most basic function is to provide health education to the community so that acceptable behavioural change can be observed. It can then move upto blood smear techniques, microscopic diagnosis, treatment and facilitating vector control by Government staff. Depending on the area, it may be one or two persons.

Training

Training has to be inparted in the knowledge and skills as considered appropriate for the specific geographic locality. This would include:

1. Clearly acceptable messages on malaria
2. Personal protection measures
3. Slide preparations
4. Slide microscopy/Transfer to microscopy centres
5. Treatment schedules and complications of treatment
6. Referral mechanisms
7. Facilitating vector control measures

Payments

It is ideal if volunteers are not paid directly for services by the system. Depending on the amount of time spent per individual the beneficiaries may be encouraged to pay.

The link workers are likely to have a greater work load in their hands and may have to have some methods of payments. It is preferable if the panchayat can take part in the selection of the link worker and also pay for services. This aspect needs further dialgoue and planning.

- Rajaratnam Abel, RUHSA, CMC-Vellore

APPENDIX - G

Health Education : Challenges in Malaria

ISSUE	TARGET	METHODS
1. Personal Prophylaxis	Community Students Tourists/Tour operators	Folk theatre; door-to-door; TV/Radio Curriculum; TV; Magic shows, etc. Guideline pamphlets.
2. Adult Vector Control	Village Groups/Councils Panchayats	Folk Theatre; Talks/presentations Audio-Visual presentations, Group discussions
3. Larvicidal Measures	Village Groups/Councils Panchayats	Exhibitions Audio-visual presentations
4. Rational Care	a) Doctors/RMPs/Quacks ANMs/MPWs	Written guidelines/textbook changes; Audio-visual presentations; Workshops; Pamphlets.
	b) Community Patients/ Relatives	Posters, Pamphlets, Flip Charts verbal by health care provider.
5. Vulnerability/ At risk	Community Patients/ Relatives	Posters/Pamphlets, Verbal by health care providers; TV/Radio.
6. Economic Aspects	Legislators/Ministers/ CII/FICCI Pharmaceutical Industry	Audio-visual presentation; Pamphlets/Flyers.
7. I.S.M. / T.S.M.	Modern Medicine Practitioners	Audio-visual presentations - Providers with studies
8. Changes in NMEP Policies	MO I/C PHC CMHOs Lecturers- PSM Supervisors, Pharmaceuticals	Workshops; presentations

Sunil Kaul, AVARD-NE

APPENDIX - H

Messages in Health Education in Malaria

1. Malaria is caused by a blood parasite transmitted by mosquitoes.
2. The mosquitoes usually bite in the early part of the night.
3. The responsible mosquitoes usually breed in clean water, both collected and in streams.
4. In malaria endemic areas if a person has fever with chills, suspect malaria.
5. When malaria is suspected, ask for a blood smear if within easy reach.
6. When malaria is suspected give presumptive treatment according to a prescribed dosage.
7. Use mosquito nets preferably impregnated with medicine to keep mosquitoes away.
8. Other methods of keeping mosquitoes away are neem oil. Smoking neem oil orleaves, mosquito mats, mosquito coil.
9. When malaria is suspected and such a person has severe headache or becomes unconscious suspect cerebral malaria and provide emergency medical treatment.
10. Take steps to ensure water is not stagnant around the house, near the well, in the fields, in cans or other containers for more than a week.
11. Mosquitoes transmit the disease from an infected to an uninfected person.
12. Blood smear is the only way to confirm the diagnosis of malaria.
13. Recurrent or chronic malaria can lead to anemia, abortion, low birth weight of babies etc.
14. It is cheaper to prevent malaria than it is to cure it.
15. Covering your body with clothes like women do, can decrease the chances of malaria.
16. These days, malaria can kill. Any body having high fever and having persistent severe headache or becoming unconscious may have cerebral malaria.
17. Incomplete treatment for malaria is more dangerous (to the community, but we can hide that!) than no treatment at all.

-Rajaratnam Abel, RUHSA, CMC-Vellore.

APPENDIX - I

Role of NGOs in Malaria Control

1. Health Education (detailed strategy separately) - See Appendix G

2. **Training of NGO Health Workers and Community Volunteers**
   - ⇒ Microscopist / Lab Assts.
   - ⇒ Treatment depot holders
   - ⇒ Develop and use algorithms in fever management
   - ⇒ Link workers / volunteers.

3. **Provide skills to people in the use of**
   - ⇒ Insecticide spraying
   - ⇒ Preparing impregnated bed nets
   - ⇒ Biological control of larvae
   - ⇒ Using traditional repellants and other control measures.

4. **Monitoring and Evaluation programme**
   - ⇒ Develop indicators for monitoring and evaluation
   - ⇒ Carry out regular surveillance according to indicators
   - ⇒ Develop a suitable Management Information System
   - ⇒ Carry out periodic evaluation on sample basis.

5. **To train link workers / volunteers**
   - ⇒ Facilitate early diagnosis
   - ⇒ Facilitate early treatment
   - ⇒ Carry out vector control
   - ⇒ Educate community.

6. **To coordinate with various health providers**
   - ⇒ To work in coordination with the Government Health Services
   - ⇒ To involve the private practitioners in malaria control
   - ⇒ To involve local and traditional healers in Malaria Control.

7. **To develop NGO resource centres**
   - ⇒ To identify suitable and interested NGOs to be developed as resource centre
   - ⇒ To identify infrastructure facilities, personnel and other resources of a resource centre.
   - ⇒ To develop selected NGO centres through infrastructure buildings and HRD of identified personnel.

8. **To identify centres where patients can be referred.**
   - ⇒ To develop an effective referral system and feed back.
   - ⇒ To monitor the referral system.

9. **To list and study all suggested / used local remedies against malaria**
   - ⇒ To design simple community based comparative studies on the efficacy of such drugs
   - ⇒ To share experience with experts for scrutiny feedback and approvals when necessary.

Rajaratnam Abel, RUHSA, CMC, Vellore

APPENDIX - J

Potential Herbal Remedies for Malaria type fevers for review and investigation

Plants from classical literature

Sanskrit Name	Botanical Name
Aamejadangha	Thymus serpyllum
Bhallataka	Semecarpus anacardium
Bhanga	Cannabis sativa
Bhustrna	Hyptis Sauveolens
Coraka	Angelics Glauca
Dronapuspi	Leucas Cephalotes
Guducı	Tinospora Cordifolio
Haritaki	Terminalia chebula
Hingu	Ferula narthex
Jiraka	Cuminum cyminum
Krsnajikra	Carum carvi
Pippalimula	Piper Longum (Root)
Rasona	Allium Sativum

Sanskrit Name		Botanical Name
Sariva		Hemidesmus indicus
Sirisa		Albizzia Lebbeck
Sitiphala		Annona Squamosa
Trapusa		Cucumis Sativas
Thriphala -	Haritaki	Terminalia Chebula
	Vibhitaki	Terminalia Bellarica
	Aamalaki	Embilica officianalis
Trivrt		Operculina terpethum
Tulasi		Ocimum sanctum
Upakunjika		Nigella sativa
Vandaka		Loranthus longiflorus
Vasa		Adathoda vasica
Vidari		Peuraria tuberosa

Local Health traditional practices use plants like

Saptaparni	Alstonia scholaris
Neem	Azadirachta Indica
Kiratatikta	Swertia Chirayita
Parijata	Nyctantus arbortristis
Lata Karanja	Caesalpinia

Several compound drugs

Kwarahari dravaka, Aranya Tulasimuladi, Pancatiktam, Sitajwaradi, Jirakadi, Bharngyadi, Ramabanam, Visamajwarantakam, Brhat Jwarankusum .

Source : FRLHT, Bangalore.

Medicines for Malaria used in Santhal Parganas by ethnomedicine Practitioners :-

Vitex peduncularis	Charaigorwa
Caesalpinia bonducella	Kath Karanj
Andrographis Paniculata	Bhuinim
Hymenodictylon excelsum	Bhurkund bark
Ailanthes excelsa	Ghorkaranj
Tinospora Cordifolia	Gaduchi
Calotropin gigantea	Akoan

Source : P.P. Hembrom, Ethnobotanist, Bihar.

APPENDIX - K

Reflections from a Veterans Meeting (October 1996)

The veterans shared many learning experiences from the past (experiences of 1940s to 1960s) and highlighted many problems that were as important those days as they are today. These included the following (not in order of any priority):

a) The Doctors - especially the general practitioners and also those in PHC often wanted more malaria since it brought good income for their practice. This callous, commercialization of health has been a continuing problem and the orientation of the medical profession has remained the weakest link in the chain of control all these years.

b) The tendency to give false data and sometimes preparation of smears by dubious methods (eg., using blood donated by staff, or blood from domestic animals etc.,) was not uncommon even in the past. Active supervision was necessary and constant motivation of staff to prevent such distortions in the programme.

c) Great importance needs to be given to environmental aspects since control of mosquito breeding sites and prevention of the development of newer sites is as important as treating cases and protecting the human population. In the old days malariologists were 'environmental' in their field orientation and gave much importance to environmental measures in every situation. This emphasis has to be reactivated in the system today.

d) The role of the entomologist is crucial since vector density varies and transmission seasons vary as well. There are unimodal and bimodal peaks and unless vector ecology and dynamic is constantly monitored, the control programme is always inadequate. The shortage of entomologists and the reduction in emphasis of basic entomological skills even in the health team need to be actively tackled if the programme has to make a headway. The study of these dynamics can also help to conserve resources since spraying can be made at more specific periods and routine or adhoc spraying can be limited.

e) There is need for adequate supervision and clarity of guidelines at all levels. Supervisor should be strict but supportive. In the old days supervisors at all levels had practical experience of control and therefore were able to guide their juniors more effectively.

f) Environmental methods such as breaching tanks, cement pointing of canals, creation of dry belt zones, rotation of crops, even shifting of villages etc., were resorted to tackle the problem. Many of these have been given up due to DDT and other measures. They need to be re-discovered and re-utilized as important adjuncts to the programme currently.

g) The stress should be on more permanent anti malaria engineering works. All development projects must be assessed for their malariagenic potential which must then be modified as part of control operation.

h) The 'veterans' recounted episodes when unavoidable deaths sometimes made villagers hostile to some aspects of the problem and many situations where the community resisted attempts or changed their reaction from 'positive participation' to 'organised non involvement'. This was however always tackled with firmness, patience and understanding.

i) In malaria control programme the attempt must be constantly made to ensure that money/fund must percolate to the beneficiary's level at the village or community and not get ineffectively disbursed or blocked at higher levels. This has been a chronic problem but when the public health team has been strong and committed in action and motivation, this problem has always been surmounted effectively.

j) Inadequacy of money, materials and manpower has always been a chronic problem leading to setbacks and failures. Sometimes resources have been available but their logistics and managements have been inadequate leading to shortages. Delayed budget disbursal has also always contributed to the problem. All this required that the programme must be supported always by good management. However relevant the technical analysis of the problem may be, bad management particularly financial management always leads to programme failure.

k) In the old days, when NMEP was in the process of phasing the control strategies from Acute to consolidation to Maintenance in each area, there were always pressures to push through the change of status before the indicators actually established the need for such a shift. Medical Officers often had problems of being transferred if they stuck to their assessment and failed to respond to such pressures. Such pressures have all along been a problem but MOs must always appreciate and standby technical assessment if the programme has to succeed and resist extraneous influences.

l) An important and crucial part of the control strategy is awareness building at all levels (IEC) but particularly focused on the community level. People need to be taken into confidence so that they understand the problem and the reason for the control strategy.

m) In the early days, the Malaria control strategy was quite successful because it was planned on a war footing and public health stalwarts did very detailed planning to make every team member be available at every place required with army precision. Planning was excellent and even through sometimes there were unavoidable human failure, it was generally well accepted.

n) An overview of field assessments and conditions reveal that there was more administrative failure rather than technical failure, whenever the control strategy was not reaching its goals. At the height of the programme - there were no vacancies at most levels, laboratory services were good, random verification was strictly done and for providing radical treatment, health teams even went upto 100 miles to find the patient in specific hamlets or villages.

o) An important learning experience from all the veterans was that public health work was not glamorous and required hard work, dedication and commitment. It was therefore necessary to support the morale of public health workers.

p) There was need for 'medical and public health' leadership to bring the real situation to the notice of people who mattered for decision making and implementation. The problem of the people should be kept to the fore and sometimes this required courage and determination. To highlight glaring facts is an important responsibility and even though risky. It has to be done.

q) Many of the veterans stressed that the man behind the machine was most important. The 'dedicated worker' was necessary to ensure that the control action was done as per the guidelines. This meant that the field ethos should be one of commitment and this could be ensured by the quality of leadership.

r) The overall health education strategy of the government has been very ineffective. The stress has been too much on family planning and many of the messages and methods even in communicable disease including malaria has become too routinised to make any impact. There is a growing necessity to involve the mass media in this process and to evolve a process of development of strategies and messages very effectively.

s) The peripheral health workers are often overburdened by numerous national programme goals that are not well coordinated and with much overlap and duplication of records etc. This needs to be studied very carefully and rationalised since it could be a major bottle neck.

t) As compared to the past, today the work culture has deteriorated rapidly. There are no health workers in the field. The Medical Officers and the supervision do not move out of their centres. There is no framework of discipline. Unless the DHOs become 'Basic Health Workers' and are out in the field supportively guiding and supervising their team of workers there is no possibility of success in our efforts.

u) Another important problem is that every one wants to be a supervisor and no one wants to be a worker today. Supervisors often do not have practical experience themselves so they cannot train, orient or motivate the team effectively. There is therefore a real need to provide field experience for trainees and probationers to ensure that they know not only 'what to do' but 'how to do' it effectively and gain practical experience of doing it.

The sharing by the veterans were an eye-opener and a good overview of the situation in the early years of the control programme. What was amply evident from their sharing was that what had suffered most in more recent years was the whole breakdown of a public health system and the disappearance of a work ethos and work culture. This work culture of the past was characterised by the following features: people first; making health teams field workers rather than table workers; a leadership which stimulated and maintained a spirit of dedication; which promoted hard work often under rather strenuous circumstances and which motivated health team members to give off their best. In such a situation the malaria control strategy or any national programme or primary health care strategy had succeeded. Today, there was urgent need to re-establish this culture.

In conclusion, the future programme strategies should move from small technical modifications/innovations to a deeper understanding of the work culture, the infrastructural realities of the primary health care system, the market economy and broader developmental issues and bring about drastic changes or responses to them - if Malaria had to be controlled again in the years ahead.

-Narayan Ravi, CHC, Bangalore

APPENDIX - L

Malaria Surveillance - A suggestion

The role of monitoring the incidence of malaria on a regular basis is to:

a) record and observe the natural trends of incidence of malaria over seasons within a year and over periods of years.

b) compare the present trends to the natural trends of malaria in the same area in the same season/cycle to be able to predcict and detect an impending outbreak or epidemic at the earliest.

c) Observe the effect of various interventions made to decrease the incidence, morbidity and mortality of the disease.

Although MF-9 Register can help identify an unusual rise in malaria cases in any, all of us who have worked in the government know that most registers get updated either at the times of inspections or when there is a cranky-stickler-for-rules officer in charge. Both are rarely seen these days.

Instead, the monthly reports and returns which are a necessary evil for any office should compel the signatory to notice phenomena eg., there can be a monthly return .

The idea is to force the MO, PHC to go through data filed up by his statisticians and clerical staff. The lower columns enforce a bilateral accountability. If a copy of such reports was to go to the zonal director / regional director i.e., one step higher also then the last columns of all such reports is what has to be monitored (for action taken) at zonal levels.

In fact, I feel one such proforma is more than enough for operatioinal surveillance - others down the line need to provide data to feed such a proforma report.

I. Name of Sub Centre	B.S.C.	B.S.E.	PV	PF	MIXED	TOTAL POSITIVE	SPR	SPR PREVIOUS TWO MONTHS	SPR 12 MONTHS SAGO	SPR 14 MONTHS AGO.	Pf Prop
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) (9)	(10)	(11)	(12)

II. To be filled by MO I/C PHC in own hand :

1. a) Is (7) > 4% Yes/No. If yes, if (7) = 2 X (11) — ACTION TAKEN SELF

   b) If average of (7) (10) and (11) is > 5% — INFORMED DISTRICT MALARIA OFFICER VIDE LETTER No. ..... dt. .....

   c) Is (12) > 30% Yes/No If yes, if (7) > 3%

2. a) Does (7) show > 20% increase over (8) — If yes, action taken self .....

   Does (7) show > 30% increase over (9) — Informed Mobile Epidemic Control Unit Vide letter No.....

III. Any letters sent to DMO and Mobile Epidemic Control unit more than 15 days ago and action not taken? If yes, details ..... dt. .....

* Rural values-
Sunil Kaul, AVARD-NE, Jorhat, Assam.

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Dr. P.N. Sehgal currently Consultant at the Voluntary Health Association (VHAI) of India is ex-Director, National Institute of Communicable Diseases, Government of India. His specialisations are Public Health, Epidemiology and Control of Communicable Diseases. He has had several decades of experience and insight in Malaria care and Malaria control. He was the first person in India to detect the resistance of **P.falciparum** to Chloroquine in Diphu areas of Karbi Anglong district of Assam in 1973. He has been actively involved in Malaria training, research, control and evaluation of the programme since 1956. He was member, Consultative Committee on alternative strategy for NMEP and research needs in the field of Malaria (1974); Team Leader, Evaluation of NMEP and **P.falciparum** Containment Programme (PfCP) - 1974, 1982 and 1984; Chairman Technical Advisory Committee on Malaria, Government of India (1987).

In recognition of his scientific contributions Dr. Sehgal has been awarded Fellow of National Academy of Medical Sciences, India (1983), Fellow of India Society for Malaria and other Communicable Diseases (1974), President of the Society (1986-87); Member of the International Epidemiological Association (1975), and a number of WHO Fellowships. He had a number of short-term assignments with WHO, in the South East Asian Region. He was also Deputy Commissioner MCH and Family Welfare Deptt., Ministry of Health, Govt. of India (1984-86). He has published over 150 papers in scientific journals on various Communicable Diseases in India covering the oldest diseases Plague, Small Pox, Malaria, Dengue/Haemorrhagic fever, Kala-azar, Cholera, etc. to the latest AIDS. The other recent VHAI publications written by him are : "Malaria Control - Capacity Building in Community based NGOs/Workers" and "Towards Effective Policy and Strategy for HIV infection/ AIDS".

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She has coordinated the Low Cost Drugs and Rational Therapuetics activities of VHAI and issues related to Rational Drug Policy, Rational Drug Use. She is the Coordinator of All India Drug Action Network, Asian representative of International People's Health Council, Association with Actional for Rational Drug in Asia, Educators for Rational Drug Use. She was the first recepient of the Dr.Olle Hansson award for showing moral courage and her contribution to Rational Drug Use

nationally and globally.

She had been involved in the 3 Malaria epidemics in Rajasthan, Assam and Mewat region, as well as the Cholera epidemic of 1988 for which she was one of the 3 member Commission set up by the Supreme Court to investigate.

Her major areas of concern are impact of globalization on national and global health and other policies affecting the marginalized specially women and issues of equity and social justice in health care.

She has been actively advocating against increasing commercialization and pharmaceuticalisation and distortions and disparities in health care.

4. Dr. A. Nandy, MBBS, DCP, M.D.

Professor & Head of the Department of Protozoology & Division of Parasitology, Calcutta School of Tropical Medicine, In-charge, Malaria Clinic & Central Kala-azar Laboratory, Calcutta School of Tropical Medicine. Prof. Nandy has been working as Advisor to TDR., W.H.O., Expert group member, Govt. of India, I.C.M.R., DST. DRT on Kala-azar and Malaria.

5. Dr. Rajaratanam Abel, MBBS, MPH.

He is the head of RUHSA. He has worked extensively in Community Health related programmes in Nepal, Himachal Pradesh, Bihar, Punjab, Maharashtra and Andhra Pradesh. As the incharge of RUHSA, an integrated Primary Health Care Programme in North Arcot, he is involved in preventive health care work, providing low cost curative care, rehabilitation services, income generation, economic activities, agriculture and environmental programmes, besides, literacy, vocational training, women's development programmes. He has been involved in several research programmes and published extensively in national and international health and scientific journals.

He is a working group member of the Tamil Nadu State Planning Commission for the 8th and 9th Five Year plans.

He has coordinated several training programmes in RUHSA and outside for NGO's involved in health and development work; provided consultancy services and evaluation.

6. Dr. Sunil Kaul, MBBS.

Dr. Sunil Kaul is currently working with AVARD-NE since April 1996, for North-East and in Majuli, Jorhat. He has been associated with URMUL Trust, Lunkaransar since 1990. He did his MBBS from AFMC, Pune (1983). He had worked in Army Medical Corps from 1983-1994 and resigned from the Commission as a Major in 1994. He was one of the key persons in providing relief during Malaria epidemic in Rajasthan in 1994, and training and coordinating medical work. Have helped organise rural health programmes for primary health care, tuberculosis and malaria in particular. Deeply believes in democratic, decentralised participatory approach to health work including decision making. Has written numerous sensitive and insightful articles about life and health care in rural India.

Voluntary Health Association of India (VHAI)

Voluntary Health Association of India (VHAI) is a non-profit registered society formed by the federation of Voluntary Health Association at the level of States and Union Territories. VHAI links over 3,500 grassroot-level organisations and community health programmes spread across the country. VHAI's primary objectives are to promote community health, social justice and human rights related to the provision and distribution of health services in India.

VHAI fulfills these objectives through campaigns, policy research and press and parliament advocacy; through need-based training and information and documentation services; and through production and distribution of innovative health education materials and packages, in the form of print and audio-visuals, for a wide spectrum of users—both urban and rural.

VHAI tries to ensure that a people-oriented health policy is formulated and effectively implemented. It also endeavours to sensitive the large public towards a scientific attitude to health, without ignoring India's natural traditions and resources.

Community Health Cell is the functional unit of the Society for Community Health Awareness, Research and Action, which is a Community Health Resource Centre in Bangalore, Karnataka. It creates awareness in the principles and practice of community health; undertakes community oriented research; evolves educational strategies and supports community health action through voluntary as well as governmental initiatives.

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